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Azadi Ka  
Amrit Mahotsav



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The odyssey of the women  
scientists of odisha



Editors

Sanghamitra Pati  
Bijaya Kumar Mishra  
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INDIAN COUNCIL OF  
MEDICAL RESEARCH

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REGIONAL MEDICAL RESEARCH  
CENTRE, BHUBANESWAR

## ODI-SCI: THE ODYSSEY OF THE WOMEN SCIENTISTS OF ODISHA

### Published by :

ICMR-Regional Medical Research Centre,  
Chandrasekharpur, Bhubaneswar-751023, Odisha, India  
Phone: 91-674-2301322, Fax: 91-674-2301351  
Website: [www.rmrcbbsr.gov.in](http://www.rmrcbbsr.gov.in)

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ISBN : 978-81-955532-0-4

Cover Design : Mr. Satyabrata Das

Printed at : Odisha Text Book Bureau, Bhubaneswar, Odisha

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*To those who dare to explore untrodden paths in order to  
show the world the dawn of new possibilities.*

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**NAVEEN PATNAIK**  
CHIEF MINISTER, ODISHA



सत्यमेव जयते

**LOKASEVA BHAVAN**  
BHUBANESWAR

N.396.29.8.22

## MESSAGE

Women have always been leaders in the field of their choice. Given half a chance, they can convert it to an absolute opportunity to excel and prove that they are worth it.

Women scientists from Odisha have made enormous hard work and sacrifices to reach the place where they are today. Far away from public glare, they are contributing immensely to bring about transformation in society.

I am delighted that ICMR-Regional Medical Research Centre, Bhubaneswar is coming out with a book 'Odi-Sci-The Odyssey of the Women Scientists of Odisha.' The book will certainly enlighten students, researchers and observers of scientific world. It will also encourage young women of the state to exhibit their talent in the field of scientific research.

I wish the endeavour all success.

(NAVEEN PATNAIK)

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## *Foreword*

It gives me immense pleasure to express my thoughts about this book – 'Odi-Sci – The Odyssey of the Women Scientists of Odisha.' It's about the life experiences of the brilliant women scientists featured in the book. Women have come out triumphant in many areas; there is no bigger example of their victory over all obstacles than their innumerable contributions during the pandemic.

While these women scientists may have lived and worked at different places and in various fields of science and technology, they all share the same objective – betterment of humankind. This book captures not only this core philosophy, but also the hurdles they come across and how they overcome those. The chapters of the book will inspire many more women to take science as carrier.

It is my pleasure to introduce this book to you to commemorate the International Women's Day and the International Day of Women and Girls in Science.

I wish more young girls tap their energy of creating change and helping millions of lives through their endeavors. I urge them to dream big, never let anything kill their passion, and keep passing on the baton of knowledge to the future generation.

*Manju Sharma*

**Prof. (Dr.) Manju Sharma**

Former Secy. Department of Biotechnology, GOI  
Chairman, New Initiatives, NASI



## *Introduction*

In this day and age of “modern progressiveness”, gender roles and stereotypes are still prevalent despite the victory and strides that women have achieved in securing a place in workforce. Despite gender disparity in certain fields, women have held high the keys to their destiny. They have always had that ability and have known how to carve their potential. They have been outstandingly efficient in escalating their domestic dutifulness into achieving greater heights. They have transmuted their art of cooking to chemical laboratories, fine needlework to operation theatres, ration budgeting to mathematical paradoxes and economics, innate motherly instincts to nurturing students, problem solving to psychology, disciplining young ones at home to law and judiciary, running household to running freedom fighting campaigns, creating house rules to legislature, so on and so forth. It will not be an overstatement to say that a woman in herself is a complete circle. She has within her the vigor to create, foster, and transform. She is a harbinger of instinct – from the ancient to the medieval to the modern times – from the inspirational firsts who started it all to the inspirational present, who continue to startle the world with their excellence in any field. They are creators of change, and at the same time, keepers of tradition.

Continuing the thought, India has had a tradition of worshipping the female deity. Our temples, the art on them, myths and epics, folklore, music, and rituals are veneration to the feminine energy. Odisha, in particular, has imbibed this dynamism in an interminable state.

*“Bande Utkala Janani!”* I adore thee, O Mother Utkala, who has given birth to immense talent in the form of tradition, art and culture. Her daughters are marvelously gifted at whatsoever they do. Nevertheless, Odisha has nurtured her daughters as scientists in



exceptional superiority. Throughout time, they have been trailblazers in the fields of science, mathematics, law and more.

Enthused by the works in form of 'Lilavati's Daughters' by the Indian Academy of Sciences (Bengaluru) and 'One Hundred Reasons to be a Scientist' by Professor K R Sreenivasan (ICTP), we took upon this mammoth task of narrating the lives of women scientists from Odisha. To be able to represent their lives accurately may not be possible, but it's a humble endeavor to compile the thoughts. Unfortunately we could not include the life stories of some eminent women scientists of Odisha like Prof. Dr. Gourirani Ghosh, Dr. Sushama Panigrahi, Prof. Dr. Priyatama Deo and Prof. Dr. Subasini Lenka, who will always remain the source of inspiration for thousands of aspiring women scientists.

Odi-Sci – The Odyssey of the Women Scientists of Odisha takes the readers through an emotional ride of giggles and tears, silence and sighs, upsets and reliefs. Not only it diarizes the high points of the women scientists' career, but explores the struggles faced and the bottlenecks overcome by them, both in their professional and personal lives. Readers can also get an insight into the women scientists' preferences, desires, and favorite things to do. The scientists have shared the principle of their life and a few pearls of wisdom too.

I hope the readers will experience the energy we gathered while talking to these amazing women. We wish going through these narratives acts as a motivating force for young girls who want to work in the fields of science, and gives them a boost to do wonders.

**Dr. Sanghamitra Pati,**  
Scientist – G & Director,  
ICMR-Regional Medical Research Centre, Bhubaneswar.

## Acknowledgements

Dear Readers and Science Enthusiasts,

We would like to thank you for choosing to spend time with this book. The book is the result of the efforts, cooperation and the good wishes of a lot of people. So we would like to thank:

The eminent women scientists this book tells about, for their benevolence to spare their valuable time to share with us their inspiring life stories. This book is entirely the result of their amazing life history, phenomenal experiences and enlightening views, which they shared with us.

Padma Shree Prof. Dr. Balram Bhargava, Secretary, Dept. of Health Research and Director General, Indian Council of Medical Research, who has always blessed us with his expert guidance and support during all our endeavors regarding research and science communication.

Dr. Samiran Panda, Former Additional Director General, Indian Council of Medical Research, for providing his expert guidance and support during all our efforts of research and science communication.

Dr. Nibedita Gupta, Head, Division of Epidemiology and Communicable Diseases, Indian Council of Medical Research for her expert guidance and support during all our endeavors of research and science communication.

Dr. Rajni Kant, Director, ICMR-Regional Medical Research Centre, Gorakhpur & Head, Division of Research Management, Policy, Planning and Coordination, Indian Council of Medical Research, for extending his wholehearted support to our efforts of science communication and publishing.

Shri Manoranjan Panigrahy, Chief Commissioner of Income Tax, and former Secretary of Odisha Culture, Information and Public Relations Department, for his valuable editorial inputs and for the extensive handholding he has provided during the publication process.

Shri Subroto Bagchi, author, entrepreneur and business leader, for aptly suggesting the title that is most suitable for the book.

Ms. Kasturi Ray for extending her editorial support to us to refine the book to a great extent.

Mr. Satyabrata Das for providing his artistic expertise and designing the cover of the book beautifully.

Dr. Ardhendu Shekhar Acharya, Dr. Manoranjan Ranjit, Dr. Anna Salomi Kerketta, Dr. Sidhartha Giri, Dr. Ira Praharaj, Dr. Debductta Bhattacharya, Dr. Prakash Kumar Sahoo, Dr. Srikanta Kanungo, Dr. Nityananda Mandal, Mr. Raj Kumar, Mr. Pinaki Chatterjee, Mr. Arjun Kumar and Mr. Purna Chandra Nayak for their wholehearted support and help in publishing the book.

The Library and Publication committee, and the staff of Administration Division, Accounts Division, Office of the Director and Library of ICMR-Regional Medical Research Centre, Bhubaneswar for facilitating the publication of the book.







## The Speaking Computer - Swimming against the Stream

*Prof. Dr. Sanghamitra Mohanty*

Welcoming the twins - a girl and a boy - in Cuttack on April 1st 1953, her father said, “my daughter will be Madame Curie” and her fate was sealed. As a young girl, she would confront everyone saying, “I will be myself.” She did prove to be quite inquisitive and experimental with everything since her very childhood. Often she would come back home with injuries from experimenting with the swing or climbing a tree without the support of hands or trying to jump into a well with the curiosity of seeing what is inside it. She was called the “running girl” as she never walked at a normal pace. She would not step away from even confronting the truth, if it came to that.

Dr. Sanghamitra Mohanty went to a Primary Convent school in Puri, then to a girls' school till Class 11, followed by other schools and colleges as her father was in a transferable job. Being born in a family where education was supported for all most certainly had its perks, but the conservative maternity could not be overruled. Having not been allowed to pursue engineering, she chose getting a masters degree in Physics. When she wanted to pursue Ph.D., she was allowed to do so only on one condition - marriage. Her mother gave her an ultimatum that she could enrol herself in a Ph.D. program only if she got married. All in a jiffy, she took marriage as the bait to Ph.D. and luckily got a very supportive Physicist as a husband, as she had always wanted.

At the junction of choosing what to do next, she had two options- research in Physics or the challenge of something unknown- Computer Sciences. Owing to her experimental instincts,

she chose to pursue research in Computer Science just because no one had ever done it before. Although she utilised a lot of knowledge from her education in Physics, she came up with something which the world had just started talking about now but she had been teaching for the last 30 years - Artificial Intelligence. Quoting statements of her friends, she is all giggles saying, “I never think straight. I always have the itch to think the other way round. All my friends tell me the same that I do not think like others.” This nature of hers made her make the computer speak. She always thought to bring out the manner in which a human mind works and teach it to a computer. In the era of second generation computers, where one had to maintain a certain room temperature and sterility to access computers, she developed programs for optical character recognition system, face recognition system, emotional recognition from a face, natural language processing systems, text-to-speech recognition, especially for her native language, Odia - and all were her original theories. She has 13 intellectual property rights to her name. Output of her “out of the box” thinking was recognized by the Government of India and for the first time, they launched a course called 'ME in Computer Science Engineering' with specialization in knowledge engineering at Utkal University, Bhubaneswar.

Doesn't it all seem so easy? No, it has never been a cakewalk. Dr. Sanghamitra had to learn early to swim against the stream and cross obstacles naturally. There has not been a single time when she hasn't faced bias for being a woman. She recalls that it has always been tests over and over again, like 'agnipariksha'. She was constantly doubted upon about her teaching skills; whether she would be able to do good research, whether she would make a good family, whether she could handle big posts at such young age. She has had to face challenges at every step in her life. While carrying a child, she took nearly 2 hour, to and fro rides between Cuttack and Bhubaneswar daily for research. Just to send an e-mail for some sort of communication or submitting an article to a journal, she would have to go to different institutes where Internet and e-mail facilities were available. She was not even 40 when she became the Head of the Department at her University and she started getting life threats from her competitors. They even threatened her family that her vehicle would be hit on the way and she would die of that. Nevertheless, her strong argumentative skills, and constant practice of merit and truth are now her brand. When she was the President of Odisha Bigyan Academy, she selected 5 batches of awardees. There used to be many approaches for selection and people used to file RTIs if their names didn't come up. But during her tenure, no such events ever happened as everyone knew by

then that she would never succumb to any kind of pressure and would not award anyone without their merit. When people used to talk about equality of women, she raised her voice against it advocating for the fact that women need to be treated with more respect as they are special and not men's equals. Women are creators; they carry the ancestral harbingers. They can think parallelly about stability and discipline, they can multi-task, they can make families, and go out and work like a man. "Women are parallel processors. It's high time we realise the capabilities of women. Women can calculate the perfect amount of salt that goes in food. Women are born mathematicians." She chuckles. She has always had to argue her way up, shun bias and had to be authoritative about her merit because she is a woman.

She lives by the principle of maintaining honesty and valuing the preciousness of time. She has always argued that even if one has committed a mistake, they should never lie about it. Truth always prevails and it blooms like a lotus flower amidst all the dirty mud. She has always worked honestly, taking her decisions firmly and never being envious about other's achievements. She is a strong believer in one's merit and swears upon working hard towards one's goals. Claiming that money limits one's brains, till date, she is unaware of her salary and her husband has complete autonomy over her accounts and finances.

There has never been a turning point in her life as she has never worked with an expectation. She never gets excited about anything, and believes that nature is a giver and one should always go with the flow, without the demand of any rewards. While she was pursuing her Ph.D., she had her son, who is now a good researcher too. She considers this to be a high point in her life and a personal accomplishment she can proudly talk about. She reminisces about her parents, thinking how happy they would have been to see her holding the post of the Vice Chancellor of a University.

Remembering the people who have played a monumental role in shaping her life, she thanks her father to have always supported her in all her decisions and in educating her to her complete satisfaction. The second fatherly figure she had in her life was her Ph.D. guide. He was a strict disciplinarian but also showered her with love and blessings all the time. She had also never failed to follow his word, even if it hindered her personal life. She used to obey him like a God and took him so seriously that on his saying, she did not have another child.

She is very fond of cooking special dishes for her family. She often writes poems, stitches

and knits for her family but misses being a sportsperson. While being the Head at the Women's Study Centre, she has worked immensely on women related issues in slums and has tried to change their lifestyle by involving them in handicrafts. She loves to teach young children and encourages them to pursue research in order to uplift them. She cherishes the memories when her students tell her that they are successful only because what they learnt from her long back.

As a message to the young girls who want to pursue science and are faced with hurdles, she wants to convey to them that obstacles are only temporary. One should work ahead with utmost sincerity; one should never try to take personal benefits, never be afraid of little things, never be envious or fight with anyone, and never lie as it would mean cheating oneself.







## Biology agin “Name, Fame, Fortune”

*Padma Shri  
Prof. Priyambada Mohanty Hejmadi*

Born in Cuttack to an engineer father Shri B. C. Mohanty and a freedom fighter mother Shrimati Nisamoni Devi in the pre-independence era, Prof. Mohanty Hejmadi grew up in the air of Independent India. Her father built a house away from the busy city. There was peace and accord, leisure and freedom in the place, but there were no roads and only home-schooling was possible. Prof. Mohanty Hejmadi could go to school only when the roads reached her house. At Ravenshaw Girl’s School in Cuttack, she opted for music as a part of her curriculum. After school she joined the co-ed Ravenshaw College. Not only did the stunning buildings with manicured lawns blooming with seasonal flowers enchanted her, in no time, the joy of conducting experiments and learning Science became her passion.

Call it fate or nature’s driving force, Mohanty Hejmadi missed the age criteria to be admitted into the MBBS course. She opted for a bachelor degree with honours in Zoology under Utkal University followed by a master’s degree at the Lucknow University. She states this was an adventurous escapade that opened the gates for her to pursue her fascination for animals. She returned to her native state, Odisha after completing her masters and began teaching her newly introduced subject at Utkal University. There she got the opportunity to explore research journals and acquaint herself with new developments in her field.

Soon she bagged the Fulbright travel grant and the Barbour Fellowship at the University of Michigan, Ann Arbor. She joined the Zoology department. There she learnt the practical nuances of her subject rather than just mastering the theory from books. Fertilizing frog eggs,

grafting live tissues to chicken eggs, crossing various strains of *Drosophila* in genetic studies were some of her remarkable experiences. As life sciences were acquiring impetus, an arena of scope of studying in several fields such as physiology, cell biology and genetics was opening up, especially after the cracking of the genetic code. In her own words “the miracle of fertilization, the unraveling of genetic programming in the nascent amphibian eggs starting with the lines of tension in cleavage, complete division of egg, rearrangement of cells, appearance of different organs to make a tadpole and then the metamorphosis drew her to Developmental Biology”. This area of science fascinated her and she decided to do her doctoral research (Ph.D.) on “The transfer of Maternal Serum Proteins and their Role in Development in the American Leopard Frog *Rana pipiens*”.

Whilst the roots called her back to home in Odisha, she succeeded in establishing a laboratory for research on amphibians and on endangered reptiles in the Zoology department in Utkal University. They were involved in research on the super-regeneration in tadpoles under the influence of vitamin A when the eureka moment landed upon them. Prof. Mohanty Hejmadi and her team had a breakthrough in transforming the tail to legs in tadpoles known as ‘homeotic transformation’ by treatment with Vitamin A, and published their research in the prestigious and pioneering journal *Nature* in the year 1992. This drew international attention to her laboratory. For her outstanding research on Amphibians and Olive ridley sea turtles she was conferred the fourth highest civilian award of “**Padma Shri**” by the Government of India in 1998 (Science and Engineering), an Honorary D. Sc. From Ravenshaw University, Pitambar Pant Environmental Fellowship; and Biju Patnaik Conservation Award in 2013-14.

She was a member of the IUCN Committee for the draft of Global Sea Turtle Conservation and was the Vice-Chairman (MoEF) for protection of turtles.

As part of the Azadi ka Amrit Mahotsav, Government of India has identified 75 women scientists starting from 1948 who have contributed significantly in Science as VIGYAN VIDUSHIS including Prof. Mohanty Hejmadi.

Breaking the gender barrier she was appointed as the first woman Vice Chancellor of Odisha at Sambalpur University in 1995. She was elected as the first woman President of Indian Developmental Biology Society.

While taking up science as a career, she did not give up on her passion for music and dance. She is the pioneer in Odissi dance, whose performance in the First Inter-University Youth Festival in New Delhi in 1954 led to the “discovery of Odissi”. She has received the highest national award (Central Sangeet Natak Akademi) and the highest state awards (Upendra Bhanja and Govenor’s plaque) for her contributions to Odissi. The recipient of the titles ‘*Nrutya Saraswati*’ and ‘*Nrutya Bharati*’, has two authoritative books on “Odissi dance” and “Gotipuas” {Aryan International}. She continues to participate in various forums relating to Odissi tradition.

Prof. Hejmadi has established herself as an internationally acclaimed scientist and an institution builder. The Regional Museum of Natural History in Bhubaneswar was established due to her efforts. She was the Vice-Chancellor (I/C) of NLUO (National Law University of Odisha).

Recipient of the highest National Awards in two different fields-Padma Shri for her contribution to Science and Engineering and Central Sangeet Natak Akademi Award for contribution to Odissi dance, Prof. Hejmadi believes that passionate dedication to scientific knowledge blends seamlessly with an ardent quest for excellence in the sphere of performing arts.

*Success is a science; if you have the conditions, you get the result.*

*- Oscar Wilde*





## The Magic of Simplicity

*Prof. Dr. Dipika Mohanty*

Being a leader is often considered to be a job of the flawless, the people who cannot fail, who are extroverts, and always have a solution to every problem. But Dr. Dipika Mohanty scripted a different story altogether. It is a lesson in learning how some of the most shy people can also lead, if they put in their all into acquiring knowledge and help everyone along the way.

Born in Odisha on 9th April, 1941, she is the eldest of 5 sisters and a brother. Her childhood was something she describes as ideal, where her father, a doctor, wanted her to be a doctor as well; so much so that he'd fondly call her 'Desha Kalyan'. Her father, a pharmacologist, pursued his MD from New Zealand, but returned to India to serve his nation. Despite the lack of facilities he faced here, he wrote 60-70 papers, all of which are available online. Ayurveda, a science he learned from his mother, was the source of many of his discoveries, the chief one being that of Chorionic Gonadotropin, which he found in and extracted from cow dung. He also observed that administering the urine of a pregnant lady to plants enhanced their growth. His constant quest for knowledge inspired a culture of curiosity and learning in the family. "We were once going for a morning walk, and saw that a few patches of grass were white in colour. He asked me why it was like that; probably because something buried in the soil had deprived the leaves of chlorophyll. That is what it was like to be around him. He would start teaching me out of nowhere! That is how he would inculcate interest in us. I don't think I would ever have become a researcher had not he inspired me THIS much," she reminisces his memory.

After completing her graduation (MBBS), Dr. Mohanty left Odisha and went to PGI, Chandigarh. There, she joined as assistant professor of haematology, an area of study which was very new at that time. She sought training in the UK at the Royal Postgraduate Medical School and Oxford Haemophilia Centre for two years and returned to PGI, now as additional professor of haematology.

“Haematology is both a laboratory based and a clinic based subject; so a structured course in haematology was the need of the hour. I then happened to go to Kuwait University for another training, after returning from which I took over as the Director of National Institute of Immunohematology (NIIH) in Bombay.” Her tone that was slightly child-like in the beginning, now changes to that of a thorough professional.

“In Bombay, we introduced the DM course in haematology, in collaboration with KEM hospital, which provided the clinical wing, while mine was the research wing. We combined our resources to make sure that this 3-year course provided holistic learning. There were no separate courses for lab or clinical haematology; every student was trained in both so that if they ever had to change to critical care medicine, neurology, chemotherapy or bone marrow transplants, they would know exactly how to go about it,” she says. She adds that during the course of her practice and research at NIIH, she got just 30 beds for haematology. So it wasn't possible for her to establish a space that catered to patients suffering from haemophilia. However, it was at this time that her research department discovered the link between deficiency of factor-VIII and factor-IX in blood, and haemophilia. When this discovery was recognised by WHO and the World Federation of Haemophilia, NIIH became the referral centre of WHO for haemoglobinopathy.

Another milestone in Dr. Mohanty's professional journey has been the establishment of a division for prenatal diagnosis of haemophilia. “When I joined NIIH, the institution didn't use to offer patient care, but we established it. Many students also joined our PHD, DM, M.Sc. programs and got trained in the same. The output was good, people were collaborative and we were supported by the World Federation of Haemophilia. So we went on to establish divisions for thrombosis and haemostasis as well. I feel pride in saying that the haemostasis wing is doing exceptionally well though I had built it from scratch.” She smiles gleefully.

The one belief that has kept her going during all ups and downs is that nothing can be achieved alone. “Achievements are hardly ever for one person; they are by the team and for the team. You need a team that is compatible to progress. You give the idea, you scrutinize, you find

difficulties and then you remove them. That is how it gets done,” she says this and proudly adds that more than half of her staffs at NIIH were women. “Once someone asked me how I managed to become the best director of ICMR; how a team full of women produced the highest results! I said - Look, ladies are perfectly able and productive, when given the right facilities. You have to look after them, and with just a little bit of support, there's nothing they can't achieve,” She then goes on to cite another achievement. “We got so many patents, one of them was for building a kit that could help people detect 10 common mutations in thalassemia, including haemoglobin S and E, for just a meagre Rs. 800/-. For this, we were awarded by the then health minister, Mr. Ghulam Nabi Azad.” The twinkle in her eye widens as she recounts.

Taking forward her belief of helping everyone, Dr. Dipika became a part of the government's Jai Bigyan project, and got centres established in Chandrapur, a Naxalite area. Her work then extended to more areas like Assam, Bengal, Gujarat and Karnataka. After serving patients and students all across the country, she retired and returned to Odisha. “I was away from Odisha for 38 years. I came back and I was surprised to see that things had changed, but in the arena of medicine, there was still a lot to be done. The authorities here were not very supportive and encouraging. If anything had to be done, it had to come from our end, all of it.”

Currently serving as the Chief of Haematology department in Apollo Hospital Bhubaneswar, she set up the lab there and started her OPD as well. “Ever since I joined, we have had good academic achievements and published some acclaimed papers, especially the one on the CT cell. I remember when I was new here, Dr. Chutani told me that I would be looking after the leukaemia patients from the next day. I got so flustered wondering how I could possibly live up to his expectations! I started reading rigorously and interacting with patients to understand their needs, and I'm proud to have tried something new at this age,” she happily remembers.

Simple as her journey might seem, it was not devoid of problems. She remembers wanting always to do her best, and feeling intimidated because most of her contemporaries were boys, but she also considers herself lucky for having found people who supported her. “I remember the professors in the UK being so open that they would offer to take us out for drinks after work. To me it was a very new concept! Shy as I was, I would just spend the entire night drinking orange juice.” She laughs. The stories of her endless accolades would also be incomplete without the mention of the countless times she has been anxious of failing. “I remember once I was performing an experiment in the PGI lab where all our mice died. I was

worried that I'd be fired or something. Luckily my lab assistant pointed out that it wasn't because of anything I did, but because of serum sickness. One more time when I got scolded was when the B-12 organism, *Euglena Gracilis* died in our lab. It grows in 22 degrees Celsius and we didn't have refrigerators at the time, so it died in the heat." She cites these incidents of failure, and tells us about what she learned from them all - it is important to make one's own mistakes, because one remembers those lessons more.

From winning her first prestigious S S Mishra award for being a pioneer in the field of haematology in India, Dr. Dipika has touched countless lives simply because she believes in supporting those around her. "I believe life is difficult for everyone, so the least we can do is offer a listening ear. I also think that if you scold people, they become rebels. It's best to find a balance between one's kindness and logic," she says. She suggests everyone to try meditation and be spiritual to attain this balance. "My lab assistant Surinder used to take me to the Gurudwara. I used to love it there. I saw how the Sikh community really helps other people. I really appreciate how serious they are about the Kar Sewa. It is also the kind of thing which you don't think about when it is happening, but later you think how important it is to stay grounded and help those who have lesser than we do. I won't say I am influenced by only one religion, but listening to and understanding the Gurbani does give me strength."

Before parting with us, she wishes to tell all young girls out there to never take decisions in the snap of a finger. She thinks that today's youth is not only open but also impulsive. "Don't react, always respond. Always think before deciding. Girls today should realise that they are free to do things, but they still must assess and have patience before coming to a conclusion. People think the unhappiness they have now will last forever, but that is not the case. Take decisions with a cool mind, not in a hurry," she says.

As someone who has devoted her whole life to the cause of science, medicine and life, it is no surprise that she loves to practice gardening in her free time. Spanning across 4 decades, her tryst with life is full of learning, the biggest one of them being that the people who lead us also go through the same phases of self-doubt and anxiety like most people. What matters ultimately is that they put aside their fears and continue to work for the causes and people around them.







## A Fighter, Nurturer, Survivor

Prof. Dr. Aruna Kumari Mishra

Dreams are common to all of us, but the path to making them come true is most often not. However, it is sheer hard work that paves way for each one of us to realise our dreams. And who better than Dr. Aruna Kumari Mishra to prove this. Her story is one of gift, determination and belief in self that made her conquer hurdles and make an identity of her own as a scientist her excellence.

Born in Dhenkanal district on 25th May, 1943, Dr. Mishra is the 5th of her parents' 11 children. Her father, who was a Dewan of the princely state of Dhenkanal, fell out with the ruler around the time she was born. This caused her family to move to Cuttack, where her father practiced law and she finished her education. Her elder sister was married at the age of 19, and her mother wanted Dr. Mishra to be married as well, but it was her father who stood by her intentions of studying further as she was a brilliant student. “I used to secure the first position in class. So my father always supported me. He would fight with my mother by promising her that if I ever secured the second position, he would get me married. This fear would push me to study more and top every time!” She reminisces.

Dr. Aruna was the first female gold medallist in the botany department of Utkal University. She had many challenges coming her way since college. To begin with she never wanted to study botany; her first love was physics. “I remember one day it so happened that I got tired of standing in the lab for long hours and fainted. When my brother got to know of this, he



went and got my subject changed to botany, saying that I would no longer have to stand in the lab. That's how botany fell in my lap and plant pathology became my special paper,” she recalls. As luck would have it, this led her to the journey into the field of botany, and also introduced her to her husband, who was a forest research officer. She says, “I hadn't started my Ph.D. at that time, and he was in Dehradun. He happened to know my guide, Dr. Pitadhar Padhi and told him that he wants to marry someone who understands plants. My guide spoke to my father and right after my M.Sc. exams, I got married to him.” One might think that this was the onset of a happy professional and personal life, but that was hardly the case. Due to her husband being in a transferable job, Dr. Mishra faced trouble in beginning her research work. “It was a tough time because when I finally began my research in Utkal University, my husband ended up going to Germany for the DAAD fellowship. Around the same time, there was the 1971 war, due to which I could not obtain a visa. I had stood first in three batches of Public Service Commission examinations, but I didn't join because I wanted to go to Germany.” She laughs at the misfortune left far behind in time. Though her husband encouraged her to join PSC, Dr. Mishra was worried to leave everything behind, for it was too much to ask for. Initially an ad hoc faculty in Ravenshaw College, Cuttack, she later completed her Ph.D. from Utkal University, Vani Vihar and stayed there for 5 years. The topic of her research was 'Physiology of host parasite relation in obligate parasites and plant parasites.' Besides, she also worked on physio-sophisticated instruments, particularly P32, C14 etc. It was this highly acclaimed research that got her the highly prestigious British Council grant.

However, that feat too had its own problems. Dr. Mishra's husband was quite ill at the time, and he could not travel with her. The one year of her research in the United Kingdom was spent oscillating between work and her husband's health, at the end of which, she had to move back to India, despite her desire to continue her research. “I worked on electron microscopy and biological nitrogen fixation. My topic was to find out the reason behind failure in symbiosis. I researched why we cannot improve productivity within 100 years. The work I did at that time is still one of the leading works in the world. My guide, Dr. Nutman himself called me to ask if I could stay back and continue, but I couldn't afford to because my children were waiting for me and my husband was ailing. It was a very hard decision. But then I told myself that I could either be a grass with spread out roots, or a sal tree, tall with deep roots,” she adds consolingly. Like a

fighter who wins each time simply by taking things in her stride, she continued her work on Nitrogen fixation in rice plants through protoplast fusion. This gave her her first success story of rice rhizobium, which made her a pioneer in the field of botany all over the world.

Despite coming back and balancing career with family, the hindrances didn't end for her. What seemed like a profession of the learned had people who didn't know to treat women counterparts with equal respect. "In Utkal, my guide was the head of the department and I was practically his right hand person. So I had to do everything. That made my colleagues very jealous, but it wasn't something I could control because he was my guide. I was the youngest professor there at the age of 38, and literally no one would talk to me. I just went to classes and came back. A colleague once told me that I should get a female lab assistant, so that we can knit together and engage in women-like activities. I stayed quiet. What could I have said?" she narrates in a voice that is still clueless about what one can possibly do when surrounded by people who refuse to believe in one's capabilities.

She says, "If you are the only lady, it's not possible to overcome the bias overnight. I see a lot of women working these days. They have become competent and courageous. We did not have the courage to face the men in those days. I would be told that I became a professor at such a young age because I am a woman. What does one say to that, especially when there is no support?" She adds that what really hurt her is that these intelligent men could have joined hands with her and worked in symbiosis to improve the quality of research and education. Looking back she reflects and says, "I have not taken any independent decisions in life. It's always been someone else deciding for me – my brother, my father, my husband, my kids, always someone else. I see women nowadays are becoming very hostile. They are different and I understand where that's coming from. They are well aware that to survive here, they have to elbow others." She adds that she never faced any such problems while working abroad.

Today, Dr. Mishra is working as a professor in Utkal University and is a member of the rotary club. In a span of almost 60 years, she has been a part of path breaking projects like mine reclamation, successful utilization of fly ash, and wasteland development. For her work, she has been conferred the highly reputed awards like Siksha Ratna Award, Rajiv Gandhi Excellence Award and Scientist of the Year Award. Having established her own lab in Utkal University post retirement, she goes there to work every day. But as she looks at the glorious milestones, she

can't possibly help but recount all the times she wanted to quit and all the people who motivated her to keep going. "Many times, I thought I shouldn't have taken this path because the harder I worked the deeper the challenges became, be it at work or at home. Luckily, I met Dr. Padhi at work, who showed faith in my abilities. He made me study microbiology, the subject I went on to develop a university course in." She cites this accomplishment as the one she is most proud of. She believes that she couldn't have achieved these feats without her father and husband by her side. "My father was the one who pushed for my education, and my husband supported me after my marriage. He would tell me that anyone can perform the household duties, but no one can replace me at work," she reminisces.

Having lived a life full of challenges and conquered them all with utmost sincerity, there is a lot one can learn from Dr. Mishra's journey. A proud mother, teacher and aspiring author at the age of 78, Dr. Mishra wishes more youth realised the importance of the peace that comes with not succumbing to the demands of the world. "I think it is important to accept what life gives us and make the best of it. The world is not a fair place, but by being righteous you can dodge a lot of trouble. I also think that there should be clarity in people's minds about things that are right or wrong. We need to be mindful to not do the wrong thing, for it will eventually affect many people and ultimately the society. You may try to grow, but it is imperative to not do that at the expense of others, for that would make you a parasite," she says. The botanist in her springs out as she preaches, "Parasitism is a bad habit. The ideal to do is to be in symbiosis. Live and let others live."

Speaking to the women who aspire to be scientists, she says that a lot of the challenges are still the same though the world has moved forward. To have a career and a family is like putting each foot on two different boats. Be prepared for challenges and sleepless nights, and make sure to have a partner who supports you through it all. If in case you cannot be with your partner, be neutral and dignified. There's nothing more important for a woman than an image of dignity and righteousness.

While in conversation with Dr. Aruna, one can't help but make the connection when she remembers her childhood memories of being a hurdle racer, galloping her way to victory. In hindsight, there is so much to her life that could have been different had she been born in another

era, or in a different country. Maybe she would have had better opportunities and even greater contribution to the field of botany. She resolves this incomplete wish by saying, “Well, life at the end of it, has no meaning. You cannot predict anything, and it all comes down to your interaction with your environment, circumstances and your fate”.

The best we can do is make sure that no woman around us has to give up on her dreams like she had to, and we should work on our passion while following her footsteps of sincerity.





## Kalyani Maa- A Mother, more than Anything

*Dr. Rita Ray*

What does it mean to be a mother? Is motherhood all about women's self-sacrifice or something beyond and above that? For Dr. Rita Ray, it's about protecting and nurturing everyone, including oneself. Her story is an account of how revolutionary it is for women to simply exist with their head held high in a society that thrives on glorifying their oppression.

Born in Balasore in 1951, Dr. Ray grew up in a progressive household. The seeds of forthrightness were sowed right from her childhood when her father made sure to provide his children with proper education in a Christian school. Her face lights up when she recalls, “We were the only ones in our family to have ladies' bicycles in the house - if men could drive, so could women.” Unfortunately, their lives changed adversely when her father passed away due to a heart attack. Dr. Ray was 10-11 years old when her father's demise left them shattered without their primary earning member. However, following her drive to do something extraordinary, she studied in a school in Bhubaneswar and then in BJB College with the support of her elder brother and sister. She remembers that time of her life being filled with excitement. She became more vocal, increased her outreach activities, met teachers and discussed things, which eventually provided her great exposure.

Then she went to JNU to study Sociology. JNU for her, was full of opportunities; she got a scholarship, she found someone she was attracted to and eventually married, but more than that, JNU even further liberated her - in thinking, in outreach, in her career, in looking at things

through an academic lens. Immediately after her course, there was an advertisement, to which she replied and got a job at Utkal University. “I thought that I would go back but I couldn't because I had a lot of personal problems. In the first year of my joining there, nobody liked having a young girl around. So I felt much rejected. I did get married eventually, not because I was being forced to but because I wanted to get married. But that was not a smooth marriage. So the environment at the university became even more toxic,” she remembers her story with pain that shows in her eyes, but not in her voice. Her voice is that of someone who has lived and grown through it all.

She remembers getting filthy, crass anonymous letters every day, so much so that after 5, 6, 10 years she had to submit all of them to the police. Utkal University was never where she wanted to be, but couldn't leave due to the problems at home. She had options, but lacked courage because by then, she had children. She went to Cambridge for 2 years but the situation was bad there too because of her personal life. She had to work for 3 part time jobs with small children, but she believes it was all worth it, for had she not gone to Cambridge and JNU, she wouldn't have been as liberated as she is today. However, when she returned to Odisha, other challenges awaited her. Her marriage broke and left behind its stigma wherever she went. Even though her family members did not say anything in particular, she could feel that they saw her as incomplete. It was only her mother who truly supported her and kept her grounded.

In contrast to her tumultuous personal life, her professional life soared from one success to another, as she did a large number of international projects with WHO, EU, and regionally as well. She worked on social forestry in 8 projects, and in Food and Agricultural Ministry's project called the Bay of Bengal Project where she worked for 4-5 years. Working on 15 to 16 international projects directly as their local expert gave her the success and confidence she needed.

“Amidst all my achievements, the one contribution I'm proud of is introducing gender studies in Utkal University despite all the resistance I faced”, she says, quickly adding that she couldn't have done it without Mr. Habib Mohammed, the additional chief secretary at that time. He was a supportive father figure to Dr. Rita and helped her a lot. When he got an abusing letter that she should be dismissed, he was so sweet that he called her and tore up that letter in front of her. Since then, she looked up to him as a father figure.

She had to live inside the campus for the 36 continuous years she was in Utkal University, but she believes it ensured the safety of her children. “I did not have the confidence to move away, but then I don't blame myself because I didn't know if my children would be safer anywhere else. I had offers, but I got scared thinking about the safety and security of my children. My children say I could have been braver, but I hope they understand how suppressed I was. I'm sure they have been affected too, but I still believe they would be much better than what I was.” Her expression carries a bittersweet consolation as she says so.

Her firm stance against oppression bore sweet fruit for those after her, for there are much more women in the university now. There is an anti-harassment cell and a girls’ hostel as well. The harassment hasn't stopped completely, but she thinks as long as people are getting better education, there is still hope.

Through all of this, what saved her was her desire to nurture and give. One would think it makes a person weaker, but she believes otherwise. It shows in her attitude towards her students, in how she goes out of her way for their wellbeing. Now teaching sociology and serving as the Dean of student welfare at NLU, Cuttack, she proudly says that her students call her “Dadi Maa,” for she, unlike other teachers, tries to share their feelings. “This is such a vulnerable age, for both girls and boys, however modern they might be. They are so emotionally fragmented, and just don't know what they want, what they don't want. I always see that in their eyes, and take a lot of time to talk to them. I'm emotionally involved with them, and being there for them gives me confidence and pleasure,” she adds.

Dr. Ray jokes about the amount of pending work she has to put out, but hasn't been able to, because she has to work to live. “I ticked CPF by accident because I was sure I was not going to be here for the rest of my life. Now I have no pension and need to work to make ends meet,” she laughs.

Among her yet unpublished works, is the study of the village goddess – the Maa in every village – how it is being Hinduised, whereas a mother is neither a Christian nor a Hindu, she is just a Maa. “The guardian of the village has now been Hinduised. There is a male priest worshipping her. The males especially are very scared of standing in front of her, only the women can go to her directly.” She adds that her academic work is getting hampered for the time



being, but she hopes to get back to it and finish it soon. Now that her children are independent and she has all she needs to live, she is hopeful to be able to make time. “If I get about a year, I’ll be able to publish at least 2 books on that and other books; one is on the mining areas of Odisha, issues of irrigation, gender issues and displacement, and my passion of course – our children.” She adds that there’s no bigger joy for her than empowering people. She fondly recalls doing TV shows that made her a household name as Kalyani Maa, after the name of the show she was featured in. “I used to ride a two wheeler with my little children, I was one of the first girls who could ride a scooter. People used to tell me that when they saw a lady with 2 children riding a two wheeler, they got really scared! They tell me to be on TV because they got to know such good things from me,” she reminisces.

As a believer of simple living and high thinking, Dr. Ray’s philosophy in life is to retain all qualities of a mother; not as dictated by religion but as dictated by its emotional essence. She takes good care of herself, walks a lot, doesn’t eat out, enjoys her quiet life and loves welcoming children into her house.

Looking back, with all the struggles and hardships life put her through, she doesn’t think she would have it any other way. In hindsight, she says, “I’ve suffered a lot but I think had I not been a woman I couldn’t have survived it all. What pains me most in life is when I see a woman pulling down another woman. It’s not that men are enemies, but when women are against women I feel really sad and I try to make them understand that our strength lies in our unity.”

Knowing the woman of grit and strength that is Dr. Ray, it is only fair that we ask her to give away a few pearls of wisdom for the generations to come. To that she says, “I wish they don’t leave Odisha but work to change it. It is a beautiful place! Also, being smart is good but being a mother is much better. When I say mother, it does not necessarily mean biologically, you have to be motherly. Love others, and complement more than you compete with each other.”

To conclude at the question we began with: what does it mean to be a mother? With all its ups and downs, Dr. Ray’s story sums it up for all of us. To be a mother is to stand up for what one believes in, with strength and without conditions. To be a mother is to know that there isn’t enough love in the world, so one must become a source of it. To be a mother is to break the cycle of miseries inflicted upon one so that the ones after them wake up to a better world.







## Triumph of Passion over Everything

*Prof. Dr. Basanti Biswal*

“Choices define who we are as a person, it shows our character to the world” is a saying we have grown up with. Little choices reflect in the bigger decisions of our lives, but what we often forget is how one learns to make healthy choices in the first place. It is a learning that comes from one's family, from parents who refuse to settle for anything less than the best for their child, no matter what society says. It is only when one sees it from a young age, can one continue to find one's passion, follow it and make healthy choices when they grow up. Dr. Basanti Biswal was fortunate to have a father who made sure that she received the best possible education as a child, and was free to pursue her interests as an adult. She was also successful in finding a spouse who supported her and helped her with everything she needed to build an illustrious career.

Born in Parlakhemundi of Gajapati district of Odisha on 10th February, 1952, she was raised by an educationist father, Late Sri Narasinha Nayak and a homemaker mother Late Srimati Hemaprava Devi. Although she did struggle through her early childhood life and schooling, the environment at home was enjoyable with her parents, brothers and sisters as well as teachers and friends in school. “I passed my matriculation in 1967. At that time, it was very difficult for girls to go out and get education. Girls weren't encouraged at home for studies, but since my father was an educationist with post-graduate degree in two subjects, he pushed all of us girls to take up higher studies,” she recalls proudly. It was then that Dr. Basanti's interest in Botany sprouted, and by the time she finished her post-graduation, she was married to Prof. Udaya Chand Biswal, who is also a scientist. “I think I'm lucky in the sense that my father

encouraged me till I pursued masters and then my husband supported me to take up science as a career. I remember many of my female classmates quit their jobs and education to stay at home, and on the other hand, I got married after my masters and then started my journey to become a scientist!” she reminisces.

In 1978, Dr. Biswal started her research and subsequently completed her Ph.D. After Ph.D., she did D.Sc. in Molecular biology of aging in plants. Then she joined as a faculty member in the school of Life Sciences at Sambalpur University. “When I started my scientific career, there were many challenges like poor infrastructure, specifically in the state universities. However, since I had a love for science and had a strong commitment to develop my own laboratory, I submitted research projects to different national funding agencies and procured equipments for my research work. Moreover, I established collaborations with many other laboratories in India and abroad, and visited those laboratories. In India, I collaborated with Bhabha Atomic Research Centre, Madurai Kamaraj University etc. Among foreign countries, I visited and collaborated with distinguished photobiologists in Nebraska University, USA; University of Wales, U.K.; Institute of Grassland and Environmental Research, U.K.; University of Tokyo, Japan; Philipps University, Marburg, Germany; University of Kiel, Germany; University of Alcala, Spain I also gained recognition through International fellowships like Fulbright, Commonwealth Academic staff fellowship, DAAD fellowship, JSPS invitation fellowship etc.,” she cites. She also visited Moscow and Puschino in Russia as a member of Indian delegation to participate in bilateral discussion for a possible research collaboration between Indian and Russian scientists sponsored jointly by DST, New Delhi and Russian Academy of Sciences. She also credits her success to these opportunities where she received good training and the exposure to implement those skills in her lab.

In the course of her 26 year long career, she specialized in Photobiology, moved to signal transduction in plants and then worked on photoreceptors in plants which receive light in different wavelengths. “The signal is transfused for different responses in the plants. I worked on those, and which are mostly phytochrome, blue light photoreceptors. Blue light mediated photosignal transduction modulating photosynthesis during leaf aging and senescence was one of my major findings at Sambalpur University. I was excited by this work. Subsequently, my visit to the Chemistry department, Nebraska University, USA as a visiting professor was a landmark in my scientific career. I also worked there with a great photo biologist, Prof. Pill-Soon

Song, on photo signal transduction in plants by a special class of proteins known as G-proteins. At that time, it was not known whether G-proteins existed in plants. As the work was very novel, the paper was published in FEBS Letters, a reputed journal,” she tells us happily, adding, “I was invited by Prof. Akira Watanabe to the University of Tokyo on a JSPS invitation fellowship. There, we cloned and characterised two genes associated with leaf senescence in Arabidopsis. This work also was a landmark in my scientific endeavour.”

Dr. Biswal has 103 publications in National and International journals of high Impact factor. She has authored several books. She has co-authored a monograph “ Chloroplast Biogenesis: From Proplastid to Gerontoplast” published by Springer. She has co-edited a book (Vol.36) of Advances in Photosynthesis and Respiration series published by Springer. Dr. Biswal has been awarded with many prestigious awards. To name a few, they are: National Academy of Sciences (FNASc). Samant Chandrasekhar Award by Odisha Bigyan Academy, Prof. Gadadhar Misra memorial award by Orissa Botanical Society.

Further elaborating on her study, she said, “I also worked on molecular biology of aging of plants and studied the biochemistry of photosynthesis under environmental stress (Biotic & abiotic). As you must have seen, leaves turn yellow when they die. What actually happens to those leaves – whether those leaves are just dying or there is any other mechanism involved? There is a lot of biology in that process! It was also revealed that at that time, new genes are expressed, making the process gradual. It takes time, during which all the nutrients go up to new leaves, and several new genes are expressed, making the entire process a very interesting phenomenon.”

Dr. Basanti's passion for the subject was unparalleled to the extent that despite all the hardships of time management, poor infrastructure and lack of capital, she never wanted to give up. “I never even thought about that, because I had so much love for my subject! I was really devoted and committed. So I never felt like I was doing something very difficult, and that I should leave the project. I used to keep an optimistic and positive mind, and always encouraged my students, specifically girl students to go ahead with their endeavours,” she tells us. While the problems that came her way were the ones we hear about even today, she overcame them by submitting projects, doing collaborative work with different scientists and sending her own students to other laboratories for research and exploration.

Thinking one's work as worship and treating one's profession like God is Dr. Biswal's primary philosophy in life. "When I was at home, my mother used to tell me to read Ramayana. I did read it, but once I began to study science, I didn't find time to worship God. So I'd tell myself that work is worship, and as long as I am sincere in my efforts, God will be there by my side," she laughs. Dr. Biswal also likes to play badminton, listen to music and play the violin, especially after a hectic day at work.

As someone who has worked tooth and nail to make opportunities and experiences available to her students, she has a lot to impart to them as well. "They should inculcate three things in their minds; to be determined, devoted and sincere. They always need to remember that there is no alternative to hard work, no matter who they are and where they come from. To girls who have to manage their home and career, I want to say that I empathize. It is indeed very difficult, but I do see that girls get more support these days compared to our times. I want to tell them to keep pushing themselves through, without blaming anybody. Just do your thing, the rest will follow."

When asked about the turning points of her life, Dr. Biswal cited the one as her marriage to Prof. Udaya Chand Biswal, who supported her achieve her dreams. As compared to a generation that flinches from the idea of marriage thinking that it might hinder their education and career, Dr. Biswal's life is an exceptional example. Brought up by a father who chose her instead of the society's wishes, she went on to find a partner who made her struggle seem like a cakewalk.

At the end of the day, it is all about how the people involved stand by each other in every step of the way.





## The Story of a Diamond

*Prof. Dr. Madhumita Das*

“I’ve got three or more identities: woman, mother, teacher, geologist, and I wouldn’t have it any other way,” she begins her story with the earnest zeal of a four-year old because life, as she sees it, begins at 60, and she’s only 64.

Dr. Madhumita Das was born to a family of academicians in Cuttack. Her grand father was a teacher and her father was the vice-chancellor of Utkal University. Raised in a home of academicians, it was only inevitable for her to find a spouse from the same profession. As a child, Dr. Das was deeply intrigued by science. She was about to pursue B.Sc. in chemistry when D.D.College, Utkal University introduced the geology course for the first time. Fascinated by the opportunities related to field work and the idea of being one of the few women to go for it, she took up the subject and succeeded in it with flying colours. “There was only one other girl in my batch, but while studying or researching or even in the later days, I never really felt that geology was a field only for men. I was always equally respected and credited for my work,” she reminisces and adds that working in the field and visiting mines was what made geology her passion.

For her career of 37 years, she is utterly grateful to her Ph.D. supervisor, Dr. Satyananda Acharya. She credits all her learning and accomplishments to him, saying that he was the one who showed her the true beauty of the subject. It was the ignition of this passion that made her go on to win many accolades, like being a DAAD fellow at Heidelberg University in Germany, writing more than a 100 International and National papers, and presently serving as the Vice President of the South Asian Association of Women Geoscientists.

Speaking of her contribution to the vast field of geology, Dr. Madhumita has studied alkaline rocks, groundwater contamination, and is a pioneer in the study of pyrophyllite. A phyllosilicate mineral composed of aluminium silicate hydroxide, pyrophyllite is an industrial mineral that has its uses in the manufacturing of rubber, paints, cement and insecticides. Her contribution is specifically to the fluid inclusion studies of pyrophyllite in Keonjhar district of Odisha, which has inspired many others under her to follow the same path of research.

Apart from her interest in this scientific and field-oriented work, she has always had a keen interest in Gender Studies. She says, “I’ve always had a fascination for gender studies because when I was in Utkal University, there was a course in Women’s studies. I being a faculty in a male dominated field, would often be called to deliver lectures on women and technology, or women and environment. As I interacted more with the people in the field, my interest in it grew specially when I became the Vice Chancellor at Fakir Mohan University. She has carried out a research project on “Impact of mining on health of Women Mine Workers of Keonjhar District, Odisha”. She has supervised 22 Ph.D. students including two in Gender studies.

As is evident from her work, she is a strong advocate of gender equality, an ideology that began right from her home. “It was initially a challenge for me to balance both home and work, but once my sons grew up a little, I made sure to teach them all the housework! They would make fun of me for making them do child labour, but I didn’t budge from my stance. I believe these habits of breaking gender stereotypes must be inculcated into both men and women, simply by teaching them life skills without any gender labels. Everyone should know everything, be it a man or a woman,” she speaks her words with utmost conviction as she adds her message to the youth of today. “Why are women still suffering today, despite there being so many programs like Sarv Shiksha Abhiyan and Beti Padhao Beti Bachao? I see women who are victims of rape, domestic violence, workplace harassment, and it is time for them to raise their voices.” One can sense the passion in her voice as she goes on to advocate the belief that women are intrinsically linked to nature. “Women are natural caretakers and caregivers, and the world should know that now more than ever, given how women leaders have handled the pandemic. Be it Dr. Sanghamitra Pati from RMRC, Bhubaneswar, Angela Merkel from Germany, Jacinda Ardern from New Zealand or Tsai Ing-Wen, the President of Taiwan, they all have done a fabulous job of keeping people safe. Even the flawlessly executed Mars mission at ISRO was led by just 5 women. Across all professions, we see so many women in the lower rungs, but so few on the higher positions. I think that is changing and I hope it happens soon. I hope there will come a day when men and women together lead to a happier world, full of opportunities for both,” she says



as she quotes activist Kamala Bhasin - “Na kam, na zyaada, bas aadha aadha (Not more, not less, just half).”

While her skills at being a stellar professional make her stand out of the crowd, her habits at home surely make her one of us. In her free time, Dr. Das loves to read, cook and watch TV serials. A proud Odia at heart, she gleefully boasts of being able to cook dishes from all regions of Odisha as different people in her family come from different parts of the state, and her love of food makes her a vocal advocate against its wastage. “I have always seen that women do not waste resources, be it water, be it soil, be it forest products or be it food. So many times, when children leave food on their plates, their mothers eat it to avoid wastage. This is why I believe that women have an inherent quality of preserving resources, while taking care of the society. In geology we teach that waste can become a resource. All the raw materials which are left out in the industries can be converted to another resource, and in gender studies we note that women are always mindful of preservation, without being taught about it.” She cites another observation, stating that women are often brought up to perceive themselves as weak, and a lot can change in their fight for equality if they perceive themselves as physically, emotionally and psychologically strong. “It is also important for men to support women as they move ahead. I am extremely grateful to my sons and husband as they have supported me through all my decisions. Just like there is a woman behind every successful man, there is a man behind every successful woman.” she adds.

With all her experience and knowledge, it is only fair that she imparts a few golden words for the younger generation to follow. At this moment, the geologist in her comes to the front as she says, “Look at the element carbon, 'C'. When it is found close to the crust of the earth, at a very shallow depth, it exists as coal, a sedimentary and extremely porous light rock. But when the same 'C', at a greater depth, is subjected to high pressure and temperature, it turns into a diamond, a shining, dazzling diamond. I want to tell the youth that the choice is theirs; if they put in hard work, they will dazzle as diamonds. Hard work done with sincerity never goes waste.”

Listening to her talk about her beliefs and her journey, one would wish to have the clarity of thought that she has. As someone who has donned many hats over the years (hat of a mother, a teacher, a geologist and a woman), she has managed to carry them all with grace and elan. A known name in the list of female geologists in India, her ideals and contributions shall surely be the guiding light for many in the years to come.





**Where there's a Will, there's  
a Way.**

*Prof. Dr. Padmaja Mishra*

Prof. Padmaja Mishra is the key person behind the rise of Odisha's only Women's University. Rama Devi Women's University which was founded by the Govt. of Odisha in 2015 as the first Women's University of the state, with affiliation of all women's colleges of 9 coastal districts and Prof. Padmaja Mishra, the then Professor of Economics at Utkal University, was assigned the responsibility of grooming and guiding the infant university. Soon she was appointed as the first Vice Chancellor for one year and thereafter as second Vice Chancellor too. It was an onerous task, but she took the responsibility as an opportunity to contribute to education of women with all her energy and dedication. Today, Rama Devi University stands tall and has been able to carve out a space for itself in the higher education scenario, not only in the state but in the country too. The university offers a vibrant academic environment with strong infrastructure. Believing in giving a holistic approach, Prof. Mishra focused on all round personality and skill development of the girl students. She says that academic performance is as important as personality and character building of the young students. As far as academic programs of the first women's university are concerned, she gave a well balanced approach to expose the girls to different branches of knowledge and encouraged them to follow their interests and dreams. With her broad vision, the University focused on diversified programs: Science, Humanities, Social Sciences, Commerce & Management, Education, Journalism and Mass Communication etc. Contrary to the popular notion that girls do not pursue science, she made sure that this has to be proved wrong by the first Women's University of Odisha and



fostered strong departments of science. As a result, the infant departments of Biotechnology, Life Sciences and Computer Science of Rama Devi Women's University are now recognized by DST/ DBT of Govt. of India and the University has been covered under CURIE (Consolidation of University Research for Innovation and Excellence) program of DST, Government of India. Simultaneously, the University has also been awarded a Centre of Excellence in “Life Writing and Translation” by the Higher Education Council of Govt. of Odisha, taking all language departments into its fold. The University also exposes girls to varied skills with a Skill Development Centre, an E-learning Centre and many other facilities. This shows Prof. Mishra's vision to touch upon all aspects of innovation and creativity.

Professor Padmaja Mishra was born in Bhubaneswar on October 2nd, 1958. Since her father was in a transferrable job under the Govt of Odisha, she had to move around to different schools during her childhood. She describes that as a very enriching experience of seeing different places and people. “I have had a very enjoyable and happy childhood. I was given the freedom to do what I wanted to do and that instilled in me a sense of responsibility, discipline and time management.” She recalls, “At home the situation was extremely pleasing to pursue education as well as other skills and interests of life such as music, dance and sports etc. My parents were very keen about our education and learning. My father was very interested in exposing us to sports too. We were 5 sisters and one brother at home. My parents never discriminated between the boy and the girls.” She adds, “Everything I learned during my childhood from my parents and my grandparents, particularly my maternal grandparents, has built my personality”.

After she completed her Intermediate of Science, people around her suggested that being a good student, she should pursue science further. But, in spite of having been selected for medical education at SCB medical college, Cuttack, she chose Economics as she found it fascinating and challenging, and she wanted to learn something different. As she went deeper into the subject, she started enjoying it more and more. “I thought that it kept me in touch with the society, what was happening around and what actually mattered in people’s decision making.” After completion of her Master's degree in Economics at Utkal University, she took up teaching there though she had succeeded in All India services like Indian Economic Service and Group A allied service of Indian Civil Service. She went on to complete her doctoral degree from the University of East Anglia (UEA), United Kingdom as a Commonwealth Scholar. She

was offered a teaching job in UEA but she returned to her alma mater Utkal University to teach again. Later, she also went to University of Maryland, USA on a postdoctoral fellowship from the World Bank. She again came back to her teaching job at Utkal University.

She specialises in 'Economics of the Environment' and 'Developmental Economics', mostly dealing with poverty, inequality, development and environment. Later on, she extended her interests to gender economics also. She occupied the positions of the Head of the Department of Economics and Centre of Advanced Studies, the Director of the Centre for Women's Studies, and the Dean of the Humanities and Social Sciences at Utkal University. In between, she was visiting different renowned Universities as Visiting professor. Obviously, she was continuously guiding research and she took up various research projects. To her credit, she has the South Asian Researcher award by the Social Science Research Council of New York. She has visited many South Asian countries for her research works.

When asked about the challenges she has faced during her entire journey, she smiles and says, “Even if there were challenges, those have been learning experiences for me. So I take everything positively.” However, being a girl, she did face some constraints in the earlier days but her family was so supportive that their positivity made her easily cross the bridge. She states that it does become difficult to create a work-life balance for a working woman. “Challenges come when you raise your own family. As a mother and as a wife you have to have your share of responsibilities towards your family and kids. That is a big challenge for every woman who works outside.” Later during the conversation, she mentions that even with grown up kids, the responsibilities never get reduced. “When kids grow up, your home responsibilities do get reduced but your responsibility in the society and at the workplace grows. You shoulder more and more responsibilities. So, it is always a challenge to manage home and work simultaneously.” She grins with satisfaction, explaining how she took it with positive spirit and learned from it to make things work better in future as she understood that multi-tasking was the prerogative of women.

While asked about the low points in her life, she says, “Feeling constrained is always a low point. Sometimes you want to go somewhere or do things with a lot more freedom but you tend to put constraints on yourself for different unavoidable practical reasons and compromise on certain aspects.” Did she ever feel like giving it all up? No! Never! Rather, when she got the

Commonwealth Scholarship to do her doctoral research abroad, those 3 years were an eye-opener experience for her. She calls it her “turning point”. There she witnessed much more possibilities and autonomy. The research environment was altogether different. This gave her a limitless window to expose herself to research worldwide. Therefore, back home, she inculcated the spirit of freedom and craving for learning in her students.

Touching upon what makes her feel proud of her achievements while looking back, she reminisces her initial experiences as a teacher and researcher, and being with her students. Later on, her experiences in Academic administration in different capacities made her more versatile. She says, “Whatever little research I could do in the vast area of Economics is a miniscule contribution, but I am proud that I have always believed in maintaining quality. And when I guided young scholars, I always emphasized on this – never ever compromise on quality. And, the second thing I believe in is punctuality, which is the way to successful time management to complete any task with ease and efficiency.”

These days Prof. Mishra is adjusting to her new phase of life after completion of the formal career. Apart from her academic interests, she very much loves listening to classical and light music. She is fond of watching sports on the television, especially Lawn Tennis (that's her favourite). In her free time, she likes to read, and learn new things. Furthermore, she keeps herself busy with a lot of outreach activities. Though during her work tenure, she did not get as much time to contribute as she wanted to, there are certain measures she can take in order to help the women in rural and slum areas. Besides financial contribution, she takes out time to teach the women of villages about time management, their right to equality, and some practical ways to come out of poverty – financial literacy, economic self-reliance and economic empowerment. At whatever small scale she could, she has encouraged them to take up activities to be self-reliant, and it gives her much gratification when she sees them upscaling these activities for their economics independence. At present, as an Emeritus professor at Kalinga Institute of Social Science (KISS), Bhubaneswar, she is associated with education of tribal youth and finds it meaningful and exciting.

She preaches sincerity and honesty for all, and lives by the same rules. “You have to be sincere and honest to yourself first. Then you will be honest to the society and others. I am not saying of financial aspect only. I am talking of honesty in everything you say and do. That means

if I am honest, I am not cheating myself. If I want to do something, I will do it but with utmost honesty, clarity and sincerity. I would like to teach that. I teach it to myself and I give that message to the society – we should try to avoid saying something and doing something else.” She promotes bringing positivity into our lives amongst all the negativity in the world, saying, “We all, at individual levels, should focus on positivity, should talk positive, teach our young generation on positive constructive ideas.”

Prof. Mishra's message to the younger generation, especially girls, is to be bold and brave from within, and to start believing in themselves. “The problem with girls is mainly lack of confidence, even in urban girls. They have so much talent, but are not confident about themselves. I think they should feel confident first. Confidence is a big strength. So once you feel confident and determined from inside, there is nothing that can stop you.” Adding to that, she feels that we, as seniors, must contribute proactively towards confidence building in girls. Sometimes, a lot of them need proper guidance in helping them to dream, and build their personality and career. It is our social responsibility.

She adds that the role of family and parents in particular is more important. Without family support, it's almost impossible for any child to pursue her dreams and excel. Therefore, she would like to urge all parents and guardians to provide all possible support to girls to be strong and self-reliant. Gender justice and equality at home is a must to build character and social responsibility among boys and girls which is unfortunately not happening, and social crimes are increasing. For example, today's exposure of young minds to the digital world, the internet and cell phones etc. is both a blessing and a curse. Judicious exposure to the digital world, the ability to discriminate between valid and wrong information is something one must learn. This is the biggest responsibility of elders towards children. Apart from this, there is a lack of civic sense these days. Since present day's young population is going to be the adult citizens of tomorrow, it is crucial that they possess good civic sense, responsible citizenship, and learn to care for others, resources and our environment.

The message she offers is 'where there is a will, there is a way'.

Determination, dedication and discipline will keep you on the track you chose.





## In Pursuit of Excellence

*Prof. Dr. Sabita Acharya*

To grow one's child into a successful and balanced person, one needs to instil in them discipline, honesty, truth and faith - traits that all parents aspire for their children to have. But even if the children do possess these qualities, seldom can they consistently carry them to adulthood and implement in their life. Professor Sabita Acharya is one of the rare persons who, at an early age, understood the importance of being consistently disciplined. Discipline is a virtue that has made her contribute significantly to the field of Anthropology and Gender Studies in India.

Born to a nuclear family in Puri in the year 1960, Dr. Acharya's life is a spin-off from a traditional joint family. Her father, Late Shri Udayanath Acharya was an academic administrator who was trained and conditioned in Wardha Sevagram and finally retired as Circle Inspector of Schools. He was a Gandhian by thought, action and habits. Her mother, Srimati Dinamani Acharya was a homemaker. Although caring and rearing ten children posed a humongous challenge for both, the family managed commendably by providing the best education available and possible to all of them. "My parents knew how to reinforce the value system to promote sound functioning of our family and to strengthen the fabric of our society. From my early childhood, I saw, learnt and behaved in a free-thinking environment, free from superstition, dogmatic and biased encumbrances. Questioning and being questioned were part of our lives and it set the true foundation for having the right scientific temper and social orientation in us.

Although I was the ninth child, I was never denied any privilege or opportunity. My parents encouraged me to do the best in the field of my interest,” she remembers fondly.

It was indeed the environment of free thinking that opened the doors of Dr. Acharya's curious mind. Her elders encouraged her to take science, and fascinated by the environment of the laboratories, she decided to go ahead with the same.

As a NCC cadet since school, she continued with it through college as well. Her dedicated efforts helped her rise to the rank of 'Senior Under Officer' and she became the athletic champion of S.C.S. College for three consecutive years. The achievements and accolades continued with her being awarded the “Shriksetra Shree” award for her all-round performance in the year 1978. After graduating in Zoology as Honours in 1979, Dr. Acharya switched over to M.Sc. in Anthropology after consulting with her elder brother, Prof. Baman Chandra Acharya. “For me, science has always been an expression of the human spirit and it reaches every sphere of human culture. It not only gives an aim and meaning to existence, but also knowledge, understanding, love, and admiration for the world,” she recalls. She then pursued M.Phil. and Ph.D. in Anthropology.

Currently serving as the Vice Chancellor of Utkal University, Dr. Acharya has held many positions and discharged responsibilities like Head of the Anthropology department; Chairman, PG Council and Director, College Development Council. She has had a glorious academic career spanning over 33 years. She has also been awarded many prestigious fellowships like Commonwealth Post Doctoral Fellow, joined in Oxford University, UK and Major Research Project by UGC and many more. Dr. Acharya has authored numerous books and journals. As on today 13 students have been awarded Ph.D under her guidance. But her journey, of course, has had its own ups and downs. “My real challenge has been to build a proper work-life balance. Sometimes work took precedence over everything else in my life, and some other times, it has been just the opposite. Requirements from the domestic front were often so demanding and compelling that I had to re-prioritize my professional assignments. I had my low moments in my life when I could not create a harmonious work-life balance. Although running hurdles on the field was my favourite event, but facing hurdles at different stages of professional life and personal front was entirely different. But I had learned at home as well as in the N.C.C.



camps to remain focused, maintain discipline and patience. My learning from there helped me pave my way, block by block,” she tells us, adding that her service career could reach its present level only due to the guidance she got from her Ph.D. guide Late Professor N.K. Behura and her former senior colleague Prof. P.K. Nayak.

Coming from a family of academicians, it is no surprise that Dr. Acharya married into one as well. “My father-in-law, Professor in Physics Late Dr. Amoolya Krushna Meeshraw was a well known academic administrator and a writer par excellence and my mother-in-law late Sailabala Misra was a home maker. I could find the cultural match between two families and adaptability was easy and faster. My husband Dr. Pratapaditya Mishra and our two daughters, Mousumee and Varnalee are my true anchors. They have understood me very well, stood by me always and have adapted nicely with the situations when I remained busy in fieldwork, project work, and national and international seminars and conferences. Without their support and constant encouragement I could not have come all the way to make my journey meaningful,” she says.

Talking further about her roller coaster of a professional journey, she tells us, “From 2009 onwards, I moved from strength to strength. My international exposure started increasing with participation and chairing sessions in IUAES (International Union of Anthropological and Ethnological Sciences) in Kunming, China (2009), Manchester, UK (2013), Florianopolis, Brazil (2018) and Poznan, Poland (2019). In 2014 and again in 2015, I was engaged as a partner in a Collaborative Research Project with University of Tuebingen, Germany.” Now, she has been invited to visit for another Collaborative Research Project being held later this year in the University of Groningen, the Netherlands.

After joining as the first woman Vice Chancellor of Utkal University in November 2020, she has immersed herself in institutional development activities, be it academic, research, outreach or administrative. “ I have been associated with the university for over four decades starting from my post graduation days and I take pride in this. I have been dreaming everyday to take it to a greater height,” she says with assertion.

A huge believer in the benefits of physical fitness, Dr. Acharya is a sports enthusiast. She

has made it a point for her children to follow her footsteps and plans to turn fitness into a lifestyle for all her students at the university, too. Besides sports and academics, she loves travelling, visiting places, meeting new people and understanding their culture, behaviour and way of life.

With so much knowledge about life, academia and the world in general, it is only fair that we ask her to share a few pearls of wisdom. To this, her clear and precise response states, “Today's youth needs to remember that knowledge needs transfer of hands. Learn it, earn it, improve it, but you must transfer it to the next generation. Develop your talent, use it to empower them and include them in the decision-making process. Patience and persistence pay dividends for sure. So, work for people's good and goodness will come back to you.” She adds, “Balancing work and home are no easy tasks, and yet these are things that women are simply expected to know. While good management skills are what is often expected of them, it's only fair to be considerate and supportive towards those who are trying their best to manage them”. Dr. Acharya might have struggled with it in the beginning, but with the strong ideals her parents, Late Shri Udayanath Acharya and Late Srimati Dinamani Acharya instilled in her, her journey has become successful and meaningful. Her everlasting enthusiasm, disciplined methods, empathetic approach and maintaining positive outlook are surely going to inspire many more working women, who are struggling to have work-life balance.







## An Epitome of Passion and Devotion

*Prof. Dr. Swapna Mahapatra*

It's not every day that we come across someone who has risen to brilliant heights in their profession. Not every day does a woman find support to follow her dreams, devote herself to them and become an inspiration to those in line. Professor Dr. Swapna Mahapatra, a pioneer in the field of string theory in India, is all of these and much more.

Born in Cuttack on 13th of September 1960, Dr. Mahapatra comes from a family of academicians. Her father taught Odia literature in Christ College, and her mother was a home maker. She was a bright student and had passed I.Sc. from the prestigious Ravenshaw College, Cuttack. "My mother was the eldest in her house. So she was under pressure to get married at a very young age. But she understood the importance of education and made sure to provide us the best possible education," she recalls while adding that it was her father's decision to make them study in Ravenshaw Girls' High School, as opposed to an English medium school.

"We were motivated to excel in school. We got to study whatever we wanted to, and there was always an atmosphere of education at home, which inspired me to pursue a career in academics. I didn't even think about pursuing banking services or administrative services. As a child I felt that if I studied well, I should opt for science. Moreover, the social notion of Physics being a challenging subject pushed me further towards it," she recounts. After pursuing her B.Sc. and M.Sc. from Ravenshaw College, she went on to pursue her Ph.D. in High Energy Physics from Institute of Physics in Bhubaneswar.

Coming from a family that held education in higher regard than anything else, it was no surprise that she was married into a family of academicians and freedom fighters. Her husband, also a physicist, is the son of the great freedom fighter Srimati Annapurna Maharana. This also inspired a progressive and patriotic atmosphere at home. “It was the first time somebody had an inter-caste marriage in my family. Nowadays it is common, but at that time, some of my relatives pointed out how I could marry someone who was not a Brahmin! To me it didn't matter at all, because they were a very good family and had dedicated their entire life for the country,” she reminisces proudly. Her choice was indeed a good one, as her in-laws and husband never imposed any restrictions on her when it came to her career. Be it her post-doctoral research at TIFR Bombay, Institute of Mathematical Sciences in Chennai, or her fellowship at Germany, they supported her dreams throughout.

She worked as a pool scientist at Utkal University for two years, after which she got selected for the Humboldt Fellowship in Germany. When, she started applying for a parmanent faculty position in the best institutions of India, both in and outside Odisha, the interview questions presented a peculiar pattern. “In Institutions outside Odisha, I would be asked how I would manage, given that I am married and my husband is in Odisha. On the other hand, in Odisha, I was asked how I would manage a healthy equation since my husband worked in the same university as I! Either way, it was somehow perceived that my career would be in problem,” she laughs, adding “I had to assure them that it wouldn't be a problem. I am an individual with opinions of my own. My husband and I have independent lives together”.

In 1997, Dr. Swapna joined Utkal University as a faculty and had been working there ever since. “High Energy Physics is indeed a tough subject. A lot of developments take place every day. So you have to remain updated all the time. As I was the Head of the Physics Department and Director, Research for many years, I had not just academic responsibilities, but also a lot of Development of Utkal University administrative responsibilities. I was also a member of the university research council. So it was extremely challenging. But I am glad to have made it through,” she speaks with a never-say-die spirit. “The department was just like home to me. It was not fixed when I came or when I went! Moreover, my husband is extremely encouraging and we don't have children. So I got more time to concentrate on physics and our family, which are both equally important”.

Glad as she is about the way things have turned out, her path hasn't been devoid of disappointments. “When I joined, I was the most junior, and since then I have seen this department grow. I, along with my senior colleagues have brought it up to the highest degree we could bring it to. During the NAAC visit in 2016, the Chairman of the NAAC committee said the Physics department is the best. Even at the meeting with the MHRD, we were asked why we were not thinking of collaborating with the large hadron collider at CERN in Geneva. I told them I would love to, I had been there myself as visiting scientist; but I couldn't do it alone, I need a group. It is imperative to have a vision, and equally important to have a team that follows it. Everybody talks about world class status, but you need to do a lot of hard work to reach that level. One can't say that we just need a world class laboratory; we need a world class university as well, right?” she reflects. Having retired last year in July, she does hope that the coming generation of students will take the department to greater heights.

Across the span of her 36-year long research and teaching career, she has been a part of path breaking research work in High Energy Physics, be it the study of neutrinos, antimatter symmetry, string theory or super gravity. Among all of these subjects, string theory and the study of the neutrinos are the closest to her heart, and nothing makes her happier than publishing a good paper. “I would be working day and night for months together and finally I would be able to give something new to theoretical physics. The entire process of bringing a paper to its final publishing makes me extremely happy, and the recognition it gets us is the icing on the cake,” she says. She also considers it to be her high moment when her students get to go places and remember her. “When they get to go to some place for their Ph.D. or postdoc after completing M.Sc., and tell me that they still remember my teaching, I feel extremely happy. Many of my students come from financially backward backgrounds. So seeing the world outside Utkal is like a step-up for them. So many of them get qualified, get selected and do postdoc, Ph.D. etc. and many of them are now faculty members in the best possible institutions in the country,” she gloats with pride. She has been awarded the prestigious “Samanta Chandrasekhar Award” in physical sciences in 2016 by Odisha Bigyan Academy, Government of Odisha.

Given that Dr. Swapna is and has always been a woman of science, it is of no surprise that a scientist is what she would like to be in her next life too. Her profession and humanity are the only two Gods she believes in. “I think that being a good human being is more important than anything else. If I have an opportunity that others don't, I try to help them. There are so many

people who feel devastated, sometimes because of financial problems or personal problems. We should do our bit to make them happy, even if it is just for a moment.”

Speaking of happiness, she advises aspiring women in the field of science to follow knowledge and not money. She says, “I’m sure they would be earning quite well, but that shouldn’t be the only aim of their life at this age. Girls should have more scientific curiosity. I see that it is decreasing these days. If they are coming to the field of research, I believe they should stick to it and go higher and higher. I always tell them that there are a lot of opportunities for women scientists. Grab them with both hands! It’s important for them to think big. So I advise them to take risks.” Adamant as she may sound, she does understand their end of the story as well. “Some girls tell me that they are not as lucky as I am. Their parents want them to get married, and once they’re married, they rarely get support to study further. I tell them that if a lot of girls stand their ground, the mindset of the society is also going to change. If everybody succumbs to this pressure, things will stay the same.” She says she cannot tell the women to not get married, but she does tell them to be very rigid when it comes to their own life decisions. “I believe that parents are also responsible because they deny opportunities to their daughters, thinking that they won’t get a good person to marry later. I find it really strange that if a girl is 28, they think that the marriageable age is gone. But why? I have no clue.” She laughs.

As we come close to concluding our conversation with her, we wonder if it was simply luck that came her way and paved this path of accomplishments for her. We’re reminded of Srimati Annapurna Maharana, who denounced all her riches to live with the destitute, simply because she cared. A supportive husband, supportive parents and in-laws are not a privilege that every woman has in this country. However, what makes a person great is the way they use their privileges for the downtrodden. Dr. Mahapatra, with all her responsibilities, has never forgotten her duty towards human kind, and more importantly, women. Her kindness is a gift that keeps on giving, and is a testament to the fact that empowered women empower women.





## Winning with Honesty and Integrity

*Dr. Swati Mohanty*

Ideal and unreal as they may sound, honesty and integrity are virtues valued and nurtured in all of us. Be it through bedtime stories or moral science teachings, they are common to us all, and yet they fail to last in us by the time we grow up. While some of us blame many factors, Dr. Swati Mohanty's story is living proof of the fact that the 'realism' of the world comes in the way of our ethics only if we allow it to.

Her story began in Rourkela on 6th December 1960. Born to a Metallurgical engineer father and a mother who had dreams of her becoming an engineer, Dr. Mohanty was a naughty child with no interest in studies. “My mother would have me memorise the ABCs while I was sitting on a guava tree! It was only when I was bribed with storybooks in class 5th, I started paying attention to my studies and getting better at them.” She laughs. Luckily for her, she secured first division in 10th standard and got admitted to the Government college, Rourkela.

After completing her education from Carmel school and one year in Government college, Rourkela, she had the option to either go to UCE, Burla (now known as VSSUT, Burla) or REC, Rourkela (now known as NIT, Rourkela) of which she chose to pursue Electronics engineering at UCE, Burla. The college did not have a women's hostel at the time and we three girl students stayed in a faculty quarter. Upon further shuffling, the girls she was staying with decided to move to REC, and with them, albeit reluctantly, she had to move there as well. She had no plans

of studying Chemical engineering there, but as luck would have it, these little circumstances paved the path of her illustrious career. “As soon as I began to know the subject, I became happy with my decision. This is because I found Chemical engineering to be highly multidisciplinary. Here, we read about mass transfer, heat transfer, fluid dynamics, control systems, instrumentation, mechanical design... many thing we read about, there is an involvement of a chemical engineer. Just like you can add potatoes to every curry, you will find a chemical engineer in every sphere. For example, the electrical engineer designing control systems for a chemical plant cannot do it if they don't know the process, for which they depend on a chemical engineer. Be it a mechanical or any other engineer, they need a chemical engineer to design and build the equipments for a chemical plant. That is what made me very happy,” she reminisces with glee.

Dr. Mohanty graduated from REC in 1983 with Honours, post which she applied to various IITs for her post graduation. While she did get through IIT Madras, Kanpur and Kharagpur, she chose IIT Kharagpur to complete her specialisation in the field of process, simulation, optimization and control. “That was a different challenge in itself. We were the last batch to not have been taught programming, something we wouldn't be able to do without. We somehow managed to learn programming by ourselves and by taking up an audit course. It taught us Pascal while we needed Fortran. I did my best and managed it all within six months! Then there was our coursework and thesis, the topic of which was Parameter Estimation for Thermal Reaction of Benzene,” she remembers. After having completed her M.Tech., she got admitted to IIT, Kanpur to pursue her PhD. “I was very nervous for the comprehensive examination, because I had been told that anything can be asked to me in the viva-voce! I would see people appearing for viva-voce and not making it. I read all the books, B.Tech, M.Tech, everything and finally got through in the second attempt,” she reveals with the excitement of a child narrating something that happened just yesterday.

Ever since then, she hasn't looked back. She has countless feathers in her cap. Accomplishments of both national and international level have come her way. From having published around 50 papers in SCI journals and presented around 40 papers in national/international conferences, to co-authoring the book, "Fundamentals of Heat and Mass

Transfer" with Prof. G. K. Roy, to being a National Geoscience Awardee in the category Mineral Beneficiation, to winning the prestigious Alexander von Humboldt Research Fellowship, she has had a beautifully inspiring journey. But this too hasn't come without its problems. "The first problem was that with my specialization, we don't get many talented people in the field of process modelling and simulation. When I joined here, they expected me to get going without a mentor. I had to struggle on my own. The senior colleagues I worked with were nice, but it was mostly me working on my own. I am thankful to my ph.D. guides for making me independent. And of course, there was the problem of low women to men ratio. It was the 90s, and if you were a woman you would be noticed. People would look at me, and it felt odd, in a way that I couldn't express, but I always knew. If I was accompanied by a male, I would be stared at. In the canteen there were separate tables for women," she recalls her troubles, which continue to be a part of many women's lives till today.

However, it wasn't the hardships, but the ideals that stuck with Dr. Swati and pulled her through. No matter what she worked on, she made it a point to never mention anyone who had not contributed, nor have her name mentioned in anything that she hasn't worked on. "I went to a school where these ethics were drilled into me. I can't help it. I make sure that whatever I achieve is a fruit of my own contribution. If that goes against somebody's convenience, I don't mind. I am simply sticking to my principles. If somebody thinks they can spoil my career because I have not added that one name in the credits, so be it. That is who I am, and the way I've been brought up," she states with confidence.

"I've heard from many of my juniors, that their HoD wouldn't give permission to publish a paper unless their name is on it. I tell them that this doesn't just happen in India, it happens everywhere. I think if you're unethical like that, you don't deserve to be a scientist. Whichever junior I work with, I make it a point to make them realise that this is the taxpayer's money that they are spending. They have a responsibility to innovate something that contributes either to the field or to the society," she adds.

A firm believer of quality over quantity, she states that it is imperative for each and every paper by a scientist to have a unique contribution. "Whenever anyone asks me how they can land a fellowship abroad, I tell them that it is better to submit 4 of your best papers instead of 10



papers about the same topic. Anybody who finds novelty in your work will certainly give you an opportunity. If your publications look like routine work, they will be easily forgotten.” She goes on to add how her project on CFD simulation of an industrial scale fluidized bed roaster sponsored by HZL, Udaipur gave her maximum satisfaction and opened the door to even bigger projects. It was the reason she got to work on a project that involved removal of heavy metals from industrial effluents. “Since environmental pollution is becoming a big issue, what we are trying to do is design a system through simulation which has the optimum operating conditions and the optimum size to ensure the maximum recovery of heavy metal. This way, we'll be able to minimize the amount of waste,” she says. She also cites examples of processes where chromium and zinc could be extracted from industrial waste water for further use. “I believe that by working on initiatives like these, we can do meaningful research. Then the papers we publish will hold a lot more meaning, since they would be beneficial to the industry and the society,” she adds. Presently serving as a Chief scientist and HoD, Process Modelling and Instrumentation, at CSIR-Institute of Minerals and Materials Technology she has also worked on a project sponsored by NALCO, Damanjodi, on data reconciliation for vanadium balance of the bauxite refinery plant.

Like every woman striving to find a balance between personal and professional life, she has her moments too. She often finds herself caught up between long hours at work and taking care of her father. “I am not married, but I have to take care of my 87-year old father. I don't believe in leaving that to someone else because if I cannot even prepare food for him myself, what good am I? I do feel a bit conflicted going to work with him alone at home, but then I trust God to take care of him.” She laughs. Apart from being a devoted daughter, she likes to do gardening in her free time, is a trained Hindustani classical vocalist, and with all these years of hard work and experience, she surely has a lot to impart to today's youth.

“I always believe that if you want a change, change yourself instead of expecting others to change. The less you expect from people, the happier you will be. And to all those who aspire to pursue science in future, stop working for recognition. Think of innovations that can make a difference to the society around you.” She cites the example of 97 year-old John B. Goodenough, who won the Nobel prize for his contribution to the invention of Lithium-ion batteries. “Even at



the age of 97, he used to go to the lab and work everyday. To me, that seems like passion that can take you places. I am sure he didn't go there thinking he would win an award. He worked simply because he loved it, and that is the attitude I wish for all my students and juniors to have. If you are doing good work, one day you will get recognised for it. I repeatedly tell them that if one could be recognized simply by writing papers, the prizes would be distributed for writing the maximum number of papers. It is imperative to work with complete integrity and honesty because at the end of the day, you can fool everyone, but you can't lie to yourself.” She laughingly states that for her awards, it was never she who showed interest to apply for them, it was always her seniors/professors who nominated her, or her friends who forced her to apply. She is extremely grateful to them for believing in her, and thinks that God always sends such helpful people to those who do their work with utmost dedication.

Dr. Mohanty's life has been full of uncertainties. From being clueless about her future to almost being an electronics engineer, to working in a field where she had no one to guide her, her journey on the road seldom taken, and her crossing endless milestones is a testament to the fact that no matter how long it takes, as long as one sticks to one's passion with devotion, one will come out strong and successful in the end.





## Quitting the Comfort Zone

*Prof. Dr. Aparajita Chowdhury*

It is often said that hard work is what makes a good professional, but no professional success is ever complete if the person does not have a clear conscience. While hard work and passion go into helping someone achieve great heights, it is qualities like kindness and empathy that push one out of their comfort zone and make sure that their knowledge benefits those in need. Dr. Aparajita Chowdhury's story is an inspiring lesson about putting both professional and personal brilliance to the best possible use.

Dr. Chowdhury was born and raised in a joint family in Cuttack, where she lived till she completed her graduation. Calling it a very enjoyable, enriching and cherishable atmosphere till date, it is here she learnt her basic values, ethos and social insights. It was the environment she had at home that inspired her to pursue science, which to her is 'the systematic study of the structure and behaviour of the natural, physical and social world through observations and experiments'. Fascinated by what the subject had to offer, she found herself even more drawn to it after discovering its experiential and hands-on learning aspects.

Her insurmountable interest coupled with her father's encouragement despite her joint family's adverse pressure chalked Dr. Chowdhury's first turning point in life - her selection for the Master's course in Human Development and Family Relations at the University of Madras. Conquering this one milestone made way for many others; a string of unceasing accomplishments that includes being the first to get a Ph.D. in Home Science in the state,

receiving the coveted Commonwealth Academic Fellowship at the University of London and being a Fulbright Fellow at the University of Wyoming, United States of America (USA).

Dr. Aparajita went on to work at the Department of Home Science, Berhampur University (Odisha) as Professor. She has also served as the Dean, Head of the Department and Director, College Development Council at Berhampur University. At present, she is the Vice Chancellor of Rama Devi Women's University in Bhubaneswar.

Her humungous contributions to academia include 13 Ph.D. students, 1 D.Lit., ten books and several research articles published both in national and international level peer reviewed journals. Her research areas are Family and Gender Studies, Life Span Development and cross-cultural Family issues and her most read and cited research article till date is 'Family characteristics and adolescent competence in India: Investigation of youth in southern Orissa'. An intriguing study on effects of parenting on adolescents, the results of her research indicated that families of more socially competent participants tended to be verbally and emotionally expressive. The findings have implications for parenting and family-life education efforts in India that could have a major impact on the development of adolescent competence. Her career spanning more than 30 years encompasses these topics in much greater depth.

Carving this glorious journey was no small feat, and it came with its fair share of obstacles. Throughout her professional career, Dr. Chowdhury faced different types of discriminations. However, her personal grit and perseverance made her more determined to overcome them all. “It was a very rough journey throughout, but with the help of conviction, interest and positive attitude, I managed to sail through my professional career. Adding to this was the support of my family, especially my husband, in-laws and children who strengthened me to fulfil my ambitious dreams,” she said. It was this passion of hers that made her stay adhered to her field of work, and despite all the challenges, she walked her path like it was a joyride.

She is someone who loves interacting with people for her research. She likes spending time with her grandchildren as well. In her free time, she takes care of her plants, listens to music and goes around trekking. A lover of solving problems, she advises the youth to do the same. She says, “Being a scientist, one needs to be very open, careful, alert and judicious about making decisions in life. One needs to be extremely passionate about one's work, and also prioritize one's family, so that nothing gets left out. I also believe that if we only have like-minded people around us, we're stuck in a bubble. It is imperative for everyone to meet different people, and

know their perspectives, accept and optimize the best out of all.”

In an age of opinions and polarization, we often find ourselves drifting away from people who don't agree with us. Despite the fact that we are ever changing atoms in an ever changing world, we seldom take a step back to accommodate and accept those different from us. Dr. Chowdhury's story is a lesson about the importance of reaching out, conversing with and understanding people irrespective of their opinions, so we can grow as individuals ourselves.





## The One in a Million

*Dr. Savitri Sharma*

Opportunities come knocking at everyone's door, but they arrive more often to those who are always ready to grab them. Dr. Savitri Sharma is an exemplary example of someone so focussed that everything she loves finds a way to be done by her. A pioneer in the field of Ocular Microbiology in India, her dedication to her research and practice has led to countless accolades spanning across 42 years. The most recent of her accomplishments have been the Achievement Award by Asia Pacific Academy of Ophthalmology and her featuring amongst the top 2% scientists of the world as named by Stanford University.

Dr. Sharma hails from a modest background, where an upright and progressive upbringing in Rourkela, Odisha introduced her to the misery and ailments of those around her. It made her want to follow the path of medicine, for which she went to VSS Medical College in Burla. "It was the first time I had stepped out of Rourkela, the first time I lived in a hostel and met so many people from so many different communities. It was life changing for me," she fondly recalls. On the family front, she recalls, "In my first year of medicine, there was a pressure from my family to get married, but I resisted because I was afraid that would be the end of my education". Luckily, her father eventually agreed to let her follow her dreams, and she ended up filling up the form for a fellowship at Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry (JIPMER).

"I remember coming home one day, during a period of uncertainty, and getting two offers, one from Calcutta and another from ICMR research project in JIPMER. I preferred JIPMER because South Indian Institutes were known to offer better education and facilities," she recounts. She also found one of her early mentors, Dr. S. C. Agarwal, who was the head of the

Microbiology department at the time. Under his guidance and influence, she found herself drawn to the field of microbiology, a field that most medical students take up only when they do not have a choice. It was during this time that her fellowship ended. She appeared for the PG program in microbiology at JIPMER and got admitted. She calls this the “second and the most beautiful phase” of her life. She realised her love for beaches when she went to Pondicherry.

Her post-graduation is what she calls the best time of her life, and the glimmer of those memories shines in her eyes as she gloats about her time under the mentorship of Dr. R. Sambhashiva Rao. She says, “Those 6 years were the best. I met great people, worked in a coveted department and wrote my first publication there. That's when I realised I had a flair for writing and speaking, which I imbibed from Dr. Rao.” Dr. Rao gave her her motto in life - “A work is not done until it is published”.

During the course of the next 5 years, she completed her PG, went to KMC, Manipal to teach, and published 5 papers. It was during this period that she got married to an ophthalmologist. Her husband, a retina specialist, needed her to move with him for work, and hence began a new chapter in her life – her journey in the field of Ocular Microbiology. Since her husband worked in Aravind Eye Hospital in Madurai, she also ended up starting a microbiology lab there. She would research on the diagnosed ailments of the patients, and it was during one of these incidents that she happened to diagnose an infection of the cornea. This infection, caused by *Acanthamoeba*, was first described in the US, and Dr. Savitri was the first to diagnose it in India. “I was very excited when I first did it. I wanted to take a picture but there was no camera in the microscope. I remember I went running to the authorities, and a man there was kind enough to get an adaptor overnight. So I could take the pictures. It was one of the many times I felt immensely lucky,” she reminisces.

“At that time, people were just getting ready to go for the Madras Ophthalmology Association Conference. So I also decided to go. In the conference, I told about the infection like a story, just like I'm talking about it right now. I told that I saw this patient, this is what the organism looked like, this is what it grew into, and this is the treatment I have given. Then I came back from the conference thinking that it was merely one case presentation. When other people returned, they informed me that my paper had won the best paper award!” she remembers the story just like it happened yesterday. It was the first of her many feats. She adds, “It was a connection between commitment and the excitement of doing something new when you don't think of the reward. So I believe that you only need to do the work, the rewards will come on their own.”

From being a PG scholar at one of the premier institutes of the country in 1978, to becoming the Director of the laboratory services at LV Prasad Eye Institute, she has so far been responsible for taking care of infection control, research and diagnosis across 4 primary branches (Bhubaneswar, Hyderabad, Vizag and Vijayawada), and 36 secondary branches. She established the first microbiology lab in Hyderabad in 1991, and then one in Bhubaneswar. While her first focus is clinical microbiology, she works on diagnosis of eye infections and developing systems that look for bacteria, fungus and viruses that cause them. Throughout the years, her approach has been to take the diagnostics to a research level. So far, she has been a mentor to 7 PhD students, who have worked on different problems related to eye infections.

Other than her long list of awards and honours, one achievement that she holds very close to her heart is the establishment of the laboratory in LV Prasad, Hyderabad campus, and having made the highest contribution to the field of ocular microbiology in India. It was here that she became the President of the Ocular Microbiology and Immunology Group (OMIG).

She believes in keeping her life tidy, just like her laboratories. Her husband is currently the Vice Chairman of the LV Prasad Eye Institute. She has one daughter. She believes the tough times that called for juggling her personal and professional life would have been tougher without the support of her in-laws. “I give full credit to my mother in law, for a woman cannot have the kind of career I had without the support of her family. My husband and his parents offered complete support to me, and my daughter was looked after completely by my in-laws. I've gone abroad several times, the first time being when my daughter was just 7 months old, and each time they have taken care of everything. I've never felt any kind of restriction unlike many friends of mine, who have felt it because of their responsibilities in the family,” she says smiling from ear to ear.

On the personal front, she is really proud of the way her daughter's life has turned out, especially her marriage. Currently working as an eye specialist at Narayana Nethralaya, her daughter lives in Bangalore with her in-laws, husband and two daughters.

“In hindsight, shifting from microbiology to an even narrower subject of ocular microbiology was never my goal. It so happened that when I was teaching at KMC Manipal and pursuing my PhD, I got married. I had to move with my husband. People would ask how I managed it all, and I would simply touch my tummy and say that I don't know! It was a shot in the dark, moving from something known to something that was unknown in India at the time, but



again I got lucky and everything fell in my favour.” Her voice pumps up with a child-like enthusiasm, ready to relive it all again.

To live a disciplined life, the will must come from within. It is only then one can carve their days around a routine that will keep them productive towards their goal. The journey has been no different for Dr. Sharma, who believes in surrounding herself with nothing and no one except those who keep her mind centred to her beloved field of study. Be it having friends to discuss journals with, learning crochet, playing the Veena, Hindustani classical music and the piano to strengthen her creative muscle, she believes that it is essential to keep one's mind clutter free to be able to focus on the things that it really wants to do.

Even to this day, she wakes up early for yoga, stays off junk food and hence any physical ailments. A voracious reader, she makes it a point to read the newspaper each and every day, while also finishing books on the side. Keeping her mind active also makes her a self-dependent professional, a trait that she believes everyone should have. “I believe I should be able to do everything in my house if the maid doesn't come. I like to remain grounded, and never get flustered in case someone is not there to help me. I'm the same at work, I don't leave everything to the technicians and students. I keep myself in a way that I can do everything myself and I teach my students as well that your technicians and subordinates are going to respect you only if you are able to do the job and show them how to do it rather than just order around”.

From the epitome of discipline and knowledge that Dr. Sharma is, one can't help but imbibe a pearl or two of advice before leaving. When asked what she has to say for aspiring practitioners and researchers, she said “With time things are becoming more difficult for everyone, especially in science. I think hard work is the main thing that children have to be prepared for now, for currently the competition is very hard.”

Through a career spanning more than 40 years and countless patients, Dr. Savitri Sharma's journey has been nothing short of an inspiration as to what one can achieve when they believe in the power of focus. While opportunities present themselves to everyone, it is only a mentally active, positive and disciplined person who can make the best of them, and it is only then that the universe also makes sure that factors beyond one's control also fall into place.

“Most people miss opportunity because it is dressed in overalls and looks like work.”

- Thomas A. Edison







## Hard work. Honesty. Help

*Prof. Dr. Pramila Kumari Misra*

“I personally follow 3 H's - Hard work, honesty and helping others. That's my motto,” she states with assertion and certainty that can only come from someone who has lived, fought and mellowed over the years. Dr. Pramila Kumari Misra's story is also a life lesson inspired from her own motto that nothing is impossible when one pushes oneself out of one's comfort zone.

Born in Kuchinda village in Sambalpur district of Odisha, Dr. Misra is the fourth child of her parents, among six siblings. While her father was often away for work (with a transferable job), it was her mother who made sure all her children got to study what they wanted to. “She always wanted that all of us should read. She always created a good environment. We did not have tuitions back then. So she would tell us to sit together and help each other to study.” As she reminisces her childhood, she recounts that she wasn't a very good student till class 2. It was only after class 3 that she had a breakthrough because she was very good in English. She happened to get a scholarship for her performance, which motivated her to study more. Interestingly, after securing first position in her higher secondary exam, she hoped to pursue English Honours. “We had only two options for Honours courses - Mathematics and English. I was not interested in Mathematics, and was all set to go for English, but my teachers suggested that I study B.Sc. since I would still get to study English there. Once I got into it, my teachers Dr. Manjushree Das, Dr. Ajit Pattnaik and Dr. Naresh Pattnaik were so good that my interest shifted from English to Science! And the final step took place when one of my external examiners advised me to come to Sambalpur University and study Chemistry. On the request of my professor, Dr. Ashutosh Naik,

he finally let me study in Sambalpur University,” she recounts.

Once she joined Chemistry Honours, her 32-years long roller coaster ride with the subject began. While she did join the course with reluctance, the atmosphere of the university was such that she never looked back. To this day, she is deeply grateful to her teachers, Professor G.S. Behra and her friend, Dr. Sushree Senapati, for giving her all the help she needed. After she submitted her Ph.D. thesis, she joined as a lecturer in Sambalpur University in 1988, got promoted to the post of Senior Lecturer in 1993 and then to the post of Professor in the year 2008.

Inspirational as it may sound, her feats came laced with obstacles. Remembering how difficult she found it to fit in during her initial days, she says, “My weakness was that I never dared to speak before people. That was constant. I could write many things, but I was not able to face people confidently. Luckily, I happened to meet one of my seniors, who used to participate in different types of co-curricular activities. She encouraged me to participate in debate competitions, personality tests and all other things that were happening in the college. She never taught me what to do. I simply learned by seeing her and that turned out really well for me. I think anybody who faces this problem should simply try analysing the people around them!” A firm believer of the power of self-dependence, she thinks that there is nothing one cannot achieve on one’s own. “I remember one day my professor Dr. G.S. Behra got angry with me because I wasn’t able to get the required results. It really got to me and I worked even harder. To my own surprise, I ended up preparing 22 compounds and I wrote about 2 of them in my thesis! What I learnt from that is luck favours those who don’t give up on hard work. Even after that, if I ever felt sad or depressed, I would boost myself up instead of talking to anyone else about it.” She giggles.

In all these years, Dr. Pramila has achieved endless accomplishments. Today, she has 7 patents, 6 scholarships, and some prestigious awards like International Travel Grant Award and Young Scientist Lecture Award to her credit. Having worked with noted names in the field like Professor E. Somasundaran at Columbia University during her Post-doctoral days, Professor A. B. Mandala, Director of Central Leather Institute (CLRI), Chennai and Professor Amarnath Maitra in Delhi, she made the best of the opportunities that came her way, thus paving way for more. “I finished my B.Sc. without any guidance as such, you know. I felt lost and had to pull myself up all the time. But as I met more people from the field, I got fascinated with the subject and began to appreciate its versatility. Now, I have a lot of students. 50 of them have already got

their degree and 2 have submitted, and I tell all of them that there is no scale when it comes to talent. Anybody can work hard and get ahead in life,” she states with unshakable belief and confidence.

Just like there's a strong foundation beneath every tall structure, there is a swarm of supporters behind every person who dreams big. For Dr. Pramila, the list is long and it began with her parents, who always gave her the freedom to pursue whatever she wanted. Apart from her husband and her daughter, who have always been supportive for her career, she believes she wouldn't have made it so far had it not been for Professor G.S. Behra and Professor V.K. Mishra.

She has been working in the field of Surface Science, particularly on fundamental and applied aspects of surfactant chemistry. During the course of the investigation, she has studied the orientation and organization behaviour of surfactants in solutions and at solid-liquid interfaces which have practical importance in formulating different products beneficial in both industrial and domestic sectors. She has successfully established the existence of premicellar aggregates during the formation of micelles, which has wide applications in industries and engineering, pharmaceuticals, agriculture and food technology, chemical processes, cosmetics, detergency and so on. She has also isolated plant based natural surfactants and developed those as additives for the stabilization of coal and crude oil- water slurry, having potential applications in fuel transportation. “I have also developed a new natural gumming agent for the release of gum from silk fabrics which would be helpful for the growth of silk industries in Odisha,” she adds. Not forgetting society's benefit, at large, she has also engaged herself in developing natural as well as industry based waste materials like the shells of the snail and egg; pyrophyllite mine-waste; dolochar ash to remove toxic metal and non-metals from the ground water. “Recently, I have been working on a research project to use a forest product (Mahua oil cake) for up-rising the economical standard of the tribal people through production of food products and biodegradable polymeric film for food packaging. The research on the development of cake and health drink with low calorie and high nutrition is a recent addition to my research field,” she says. Besides all scientific activities, she is a poet, with a collection of self-written Odia and English poems; she loves to sing and enjoys reading.

As someone who has excelled in various spheres of life, be it managing a family, research or learning, she has plenty of advice to share with the aspiring scientists of today. “I believe in doing my best and leaving the rest to God. He has always been with me through thick and thin, and because I lost my parents long back, I think they are with me through the spirit of God. It was

very tough for me to fight some social taboos because I have been married to a person who is younger to me, but he became my strength, and my God was with me. So what the society had to say did not matter.” She smiles with the sobriety of a victorious warrior.

To the young women of today, she wants to say that they should simply stop thinking of themselves as “women”, because they are capable of doing everything that men can. “If they keep thinking that they are women, they won't be able to take part in the situation fully. Instead, they should simply work sincerely and not take advantage of the freedom their parents give them. I say this for their own good because if they indulge in distractions, they will not be able to explore many things that could help them,” she says. “I think students should be observant, learn from others, explore and see what is happening around. They should be aware of their surroundings, be it by knowing people or by reading. Having information of their surroundings is what makes a person confident, I think,” she adds.

“A career in research is full of failures, so it is imperative to always remain positive and work hard. I always tell my students that suppose they are going through a forest. The first time they go, it will be very difficult to find the path because there are so many stones in the way. After they have gone several times, they know what obstacles can come their way. I always tell my students that there is no absolute scale for talent, and if one works hard, one can move ahead of people who are inherently talented,” she advises.

As the famous saying goes, 'When you educate a man, you educate an individual. When you educate a woman, you educate a family.' Seeing Dr. Misra's case, one can say, 'When you empower a woman, you empower a generation.' Citing how her father supported her freedom when she was a student, she tells us, “When I was a student of M.Sc., we had to take permission from our parents/guardian each time we left the hostel. When my father got to know about this, he wrote a letter to the Superintendent, saying that whenever my daughter wants to go anywhere, you should allow her!” She laughs, adding that this is how families should support their daughters today.

Coming from a small village in Odisha to becoming an inspiration to countless students and everyone else who has crossed paths with her, Dr. Mishra is truly an example of the fact that anyone can be successful if they believe in themselves, and work consistently and dedicatedly towards their dreams.





## She Came, She Saw, and She Conquered

*Dr. Sanghamitra Pati*

When the going gets tough, the tough get going. The woman who proved this adage to letter and spirit is someone who was on the forefront of the war humanity was encountering in the face of Covid19 when it struck India in February 2020. Tall, lanky, articulate to a fault and oozing with confidence Dr. Sanghamitra Pati led a team of scientists at RMRC, the only body that was at the helm of research and findings about the novel virus that had taken the world hostage. She became the face the people of Odisha related to, believed in and looked up to with hope amid hopelessness. A perfect amalgamation of a woman full of emotions and a scientist backed by sound scientific knowledge, Dr. Pati stood by the State during the pandemic and helped sail through hard times. The journey, however, has not been easy.

Born in Berhampur, Odisha, Dr. Pati was the eldest daughter in her house and also the naughtiest of all siblings. Her father was an engineer and a history enthusiast, which is why he named her after King Asoka's daughter. A good student through her career, Dr. Pati's academic excellence shone when she secured the second rank in her MBBS entrance exam. She was sure that medicine was her calling. It was during her MBBS that she got married and had her first son. Soon after her MBBS, she worked as a physician and during this period, her second son was born. But that was not all she wanted to do. "I realised that being a physician, I couldn't do enough because I was just prescribing treatment. I couldn't cure their illness because patients were often poor and couldn't afford medicines. Seeing ill people every day would often take a toll on me. So I figured I should get into lab work and help them. I went for an MD in laboratory

subjects, but then only working with lab samples seemed too boring to me! You see, I love to interact with humans and understand people's psychology. Then I realised that I needed a middle path where I stayed in touch with people and patients even though I didn't treat them directly. That is how I found the perfect path for myself - the field of Public Health.” She describes this realisation and its pursuit as one of the first feats of her career.

Following her decision, she applied for four international scholarships for MPH and managed to get through the most coveted one - the Joint Japan World Bank Graduate Scholarship. She then went with her family to pursue her MPH course at the University of Maastricht in the Netherlands. “The course exposed me to the great world of public health, which has limitless possibilities and endless opportunities. I realised that in public health, there is space for everyone, from psychologists to topologists to statisticians. It's not only medical but also analytical and managerial. Secondly, it also exposed me to the very concept of understanding medical anthropology, health, culture and qualitative research; and thirdly, it made me think in terms of using our existing resources for the cause of health promotion,” she says. She adds that her PG and MPH dissertation was on the health behaviour of tribal women, which also ignited her interest in medical epidemiology.

Excited about putting her learning into practice in her own country, she interacted with people from slums, made them aware about cervical cancer and designed skill building programs alongside her teaching job. It was then that the second turning point of her career arrived - her joining the Public Health Foundation of India, Bhubaneswar. Set up by Dr. Srinath Reddy, it had multiple partners like Bill and Melinda Gates Foundation (BMGF) and the Wellcome Trust. “I consider it the most nurturing environment that one could expect. I found immense scope for research, applying for grants, international collaborations, writing publications – everything. There were also training programs, seminars and meetings to work with the state government. Wellcome Trust offered different capacity building grants and I got selected for a topic that I had newly developed interest in at the time – multi-morbidity. It is the idea of studying the cases in their totality, something that does not happen when we go around seeing specialists. I applied for the grant to study multimorbidity in primary care, a first in any lower middle income country, and it went through!” Her satisfaction glows on her face as she speaks of how this accomplishment established her as a pioneer in this field. She calls it the third turning point of her career.



After 6 years of taking PHFI, Bhubaneswar to newer and greater heights, Dr. Sanghamitra realized that the best way to put her skills to use would be by working on a post where she could inspire real change. Initially averse to administrative roles, she decided to take up the challenge of taking over as Director at Indian Council of Medical Research- Regional Medical Research Centre (ICMR-RMRC), Bhubaneswar.

Having worked in a corporate-like atmosphere at PHFI, she had to adjust to a new kind of organizational climate at RMRC, Bhubaneswar. To spread the knowledge of public health, she started the MPH program there, which was until that time, offered only at one other institute in the country. Calling it one of the most unique opportunities she got there, Dr. Pati says, “I knew that we were strategically in a position to practice research, field epidemiology and laboratory studies. So I thought why not combine it into a course that brings them all together? As an attempt to construct realistic models of improving public health care, I set up a Health Technology Assessment (HTA) hub, for as we develop technologies, we need to know how cost effective, ethically acceptable and feasible they are.” At RMRC, she also got to work in areas she hadn't worked in so far, like communicable diseases, virology and improvement of laboratories. “I got to witness the intersection of the roles of labs, field and clinical research. These 3 things came together, especially during the COVID-19 pandemic. I'm grateful that we had an already established Viral Research & Diagnostic Laboratory (VRDL), good epidemiologists, and the trust of the government. So we could conduct a state-wide sero-survey to innovate solutions,” she recounts.

Glorious as it may seem, Dr. Pati's journey has not been an easy one. From getting married during her under-graduation, to pursuing her PG after having two children, she has made some unconventional choices that weren't received well by those around her. “I was one of the top students of my batch but when I selected non-clinical studies after MBBS, I could see the disappointment on others' faces. When I left biochemistry and went to public health, people again asked me why I was leaving molecular biology for a sector that had no opportunities in India! I told them I wanted to work in a field that was a mix of both, but they didn't seem to understand. They would ask me questions like 'If you are not a clinician, what's the use being a doctor? Will you be a nurse?' 'You got a medical degree to become a teacher?' I felt bad, but it never hurt my self-esteem; especially once I realised that people have this perception because of



Bollywood. They grow up seeing doctors wearing green gowns, performing all kinds of surgeries and then saying that the operation was successful. They identify with that more, which is why they encourage that.” She laughs.

Even when she joined RMRC, she was the first and the youngest lady to hold the designation. She noticed that people found it difficult to treat a woman younger to them as their Director. “Many people say bad things at the cost of their own institution, without considering the broad organizational interest. If I don't get along with an individual, I would not put my institute in a bad light. However, the one thing I have learned from this is that I cannot make everyone happy. There will always be differences of opinion, and I should simply focus on my work,” she shares her grievance but happily adds a bright side to her tenure here. She heads a dynamic, motivated and passionate team that she is very proud of. “Now, my mission is to create a second generation so that when one generation leaves, the second fits in.” She adds that she found the mentor-mentee culture at PHFI very inspiring and wishes to inculcate the same at RMRC.

Although science continues to be her primary passion, Dr. Sanghamitra is an ardent admirer of cinema and literature. She finds it extremely entertaining and interesting to connect the portrayal of the sciences on screen to their actualities, so much that many of her papers are on this subject. She gladly quotes, “I Lancet-ized Bollywood.” Recalling her observations, she says, “Once I published in Lancet Oncology how films portray cancer, as opposed to its reality. It is always the hero who gets it, never the villain, because cancer has only binary outcomes. You either die or recover. But do we see anyone recovering from it in cinemas? No! It is always sad and is done to fill the mind of the audience with sympathy. I also believe that there is so much fear around cancer for this reason. There are other illnesses with more mortality rate, but thanks to Bollywood, it is only cancer that implies inevitable death. Diabetes on the other hand, is a comparatively non-binary health issue, so you'd never find it happening to a central character, but always to a peripheral one.” Outside of cinema, she loves reading mystery novels, listening to songs and visiting new places. She, like her father, believes that in order to know a place and its people, one must consume the art created there.

Dr. Pati has been named among the top 2 percentile of medical researchers of the world.

She has 2 books, 10 books chapters, hundreds of research publications and more than 20 awards of national and international repute to her credit, including the prestigious Samanta Chandra Sekhar Award by Odisha Bigyan Academy.

Her professional life has been a roller coaster ride, but she sees it as a collection of connected dots. “When I joined MBBS, I never expected that I would get into research. After that I never expected to get into teaching and then into public health. Looking back, one may think maybe it was pre-planned but for me it was always about recognizing my interest and grabbing opportunities to make it grow, of course with the love and support of my sons, parents and husband,” she says. “When you follow your passion with all your heart, the divine, the supreme, they all set out to make it happen for you”.

Excellence is a journey and not a destination. Dr. Pati's story is a journey made by fearlessly walking the talk. In our lives, both personal and professional, the right way to live is often determined by others. Our well-wishers expect us to learn the lessons they learnt, to follow the journey they followed. Little does anyone realise that no two people have the same mind and circumstances, and so no two people can afford to live life by the same book. If you have a willingness to experiment and learn, choose the road less travelled and make a mark of your own.





## A Lesson of Self-Belief

*Dr. Sujata Mohanty*

When we talk about believing in oneself, we picture resourcefulness, networking, and an 'inborn knack for things', for self-belief is something which varies from individual to individual. What we often don't consider is the process and the trying circumstances that lead one to develop self-belief. Most often, we don't know how strong we are unless challenges present themselves, and it is only in hindsight that we know that what made us shine was our ability to persevere and hope through it all. Dr. Sujata Mohanty's story is one such inspiring example.

Born to a simple family in SCB medical college in Cuttack, Dr. Mohanty spent a major part of her life in Delhi as her father was a manager working at the Delhi Milk Scheme. Her parents settled in Delhi but made sure their children kept in touch with their Oriya roots, be it the food, the language, the music or the dance of the state. Their love for their culture is reflected in their pursuit for spirituality as they were deeply involved with the Ram Krishna Mission, and dedicatedly practiced philanthropy, especially among the lepers in Odisha. As she describes it, "It was a perfectly unconventional childhood as per that time, where we were not only motivated to study but also to be involved in lots of extra-curricular activities as diverse as music and dance, playing different sports, scouts and guides, and fixing things around the house like fused bulbs & leaky taps to learn and have holistic exposure about life. I was fortunate to have my childhood with a blend of both, a very good atmosphere at home and a stimulating atmosphere at school."

Dr. Mohanty's parents never pressurised her to follow any particular profession, but it was her dream to become a doctor. However, due to the lack of proper guidance and coaching, she couldn't get into MBBS. But her passion for science was unwavering and she pursued a B.Sc, an M.Sc, and finally a Ph.D. degree from AIIMS, New Delhi. "My aim of pursuing medical sciences was fulfilled when I enrolled in the Ph.D. programme from AIIMS." She happily cites about how she couldn't get into AIIMS for MBBS but she did get in through a Ph.D. Through this path she may not be directly involved in the clinic but she is still involved with the patient health care indirectly and fulfilling her wish of helping the needy.

Dr. Mohanty's journey to her current designation as the In-Charge of Stem Cell research at AIIMS, countless accomplishments that include 150 published papers and 2 patents hasn't been a smooth road. Education, like any other career that involves leaving one's house, has always been considered a man's playground, since the field of research can require students to put in long hours at the lab. "Boys were more in number than girls at the time of my masters degree, and our practical used to take really long. I was from Jamia Millia and the commute by DTC buses used to take me an hour and a half every day. Many girls would straightaway tell the teachers that they had to leave because it was late, but I couldn't get myself to do that. I would stay back, and that would come at the cost of travelling at night with the constant feeling of being unsafe. However, by moving into a hostel, I made sure that factors like these didn't come between me and my work during my Ph.D. If somebody doubts my abilities to get work done, it provides me the will and courage to prove that I am capable of accomplishing anything. I won't be vocal about it, but I will put more effort and make sure I succeed." She laughs as her triumphant tone gives a happy ending to the sad reality that many female students go through, even today.

When Dr. Mohanty finally got a job, she joined an upcoming field of Stem Cell research. It was challenging and had a lot of hope and hype. Unfortunately, the challenges weren't just logistical and academic, but also social. "When I wrote my first project and submitted it to the funding agency, during the interview, the process was very intense, and in the end, a very senior professor assured me that if I added his name in the credits, it would be easier for me to get it passed. I could have done it, but my conscience refused. Luckily by the grace of God, he wasn't

present in the second meeting where I presented the modified proposal. It was passed and I got to do it on my own" she recounts this as one of the many instances when she was able to overcome the social setbacks. "I did not dare ask for equal credit, but in hindsight, it taught me to write proposals effectively and my success rate went up. Thanks to the skills I developed then, I learned the right way to draft my applications, and I have 3 international grants today," she narrates her story with the voice of a winner, who hasn't learnt by instinct, but by experience.

"I also learnt that slow and steady wins the race. The way I see it, life has given me everything, although a bit late. I got married late, had my children after two miscarriages, and got a permanent employment slightly late. During my pregnancy, it was a general perception in my work place that I would not be able to work efficiently. However, I disproved it and with the support of my friends and family, I joined back work when my children were just 40 days old. Ultimately life has given me a lot, for example, I had triplets, and I am the In-charge of the Stem Cell research in a glorious institution like AIIMS. So looking back, I have no complaints," she says this and like each time in the conversation, she adds a silver lining to this black cloud, by mentioning that this taught her to be more compassionate to others.

Despite being one of the pioneers of Stem Cell research in India, Dr. Mohanty believes that there can be many more like her, if given the right platform and social environment. "During my scientific career I found that women are quite sincere in their work but they happen to lack the immense networking skills as men do. In the hindsight, I realize that women must help each other and discuss their ideas rigorously so that the whole community can encourage each other & move forward together. One of my mentors & previous directors also advised me to keep up my work, my passion and never give up."

Dr. Mohanty believes that her biggest achievement has been initiating& establishing the Stem Cell research lab in AIIMS singlehandedly, which was the 1<sup>st</sup> in Northern India to be compliant with international standards. "I had to establish an international class lab, and to this day I am the only permanent person there. It's a cGMP facility dedicated to stem cell work and thereby it was a mammoth task to dig deep into the guidelines for establishing this facility as I had to acquire the knowledge of many things which were not in my domain like civil constructions and engineering; one has to keep in mind the wall size, flooring, ceiling, AC duct,

flow rate, humidity, temperature - the list is endless. It took me and my team 4 years, but we did it!” Dr. Mohanty remembers her self-belief being her saviour in moments of doubt. “The way I see it, if I cannot do it being in AIIMS, then who can? Being employed in such a prestigious institute, everybody is looking up to me for the simple reason that they believe in me, so why shouldn't I believe in myself?” Her words make one wonder how easy it is to believe in oneself, and yet, how difficult.

Though Dr. Mohanty has come out victorious of all the challenges that life threw at her, she remembers being her lowest before the birth of her children. She recalls, “I was told I cannot be a mother as I had 2 ectopic pregnancies, however I never lost hope and due to continuous and relentless efforts from my treating physicians, I was blessed with triplets. However they were 1.5 months premature and the doctors thought they'd have to be kept in an incubator, but they didn't require it for a single day; they were breathing on their own. This showed me that miracles do happen!” Dr. Mohanty considers her children to be her pillars of strength as they always encouraged her to follow her passion. “It's funny because I wanted to stop working when they were born. They, on the other hand, motivated me to work. My children came fighting into this world, and I draw my inspiration from them” she tells fondly.

Having mentored countless students during the course of her career, Dr. Mohanty is immensely grateful for them all. Her students, along with her children and family, comprise her entire social circle and support system. To quote her, “Work is in my blood. It has been a great tightrope, balancing it all, but I guess I made it because I was so neck deep in work that I didn't have time to look back & down, and I had my family and students helping me throughout.” She recalls, “At one point of time after the birth of my triplets, I wanted to quit my job and be with them. However, at that time my husband advised me that as my parents supported me all through my education, I should continue moving forward.”

Dr. Mohanty values nothing more than the different perspectives that all three of her children bring to her life. “Most people have an age gap between their children, so they know what to expect at different ages. Mine are barely 2 minutes apart so I have access to different view-points from my children in a day-to-day environment which is very stimulating and

energising for me. I used to be engrossed with them from watching their cartoons till watching informative channels like National Geographic, Discovery Channel, and critically acclaimed movies, which would lead to lively & thought-invoking discussions amongst us. So I am surprised every day.”

Living her love of science through gardening these days, as that is another thing she is fond of, she says “I love to nurture a seedling to grow it into a plant”. Dr. Mohanty wishes to tell aspiring scholars that innovation is a 24-hour job. “It never ends at the desk. I think about it when I'm engaged in day-to-day activities, when I'm trying to sleep. I think something randomly and text a student, and they reply - Mam, aren't you supposed to sleep? I say - yes, but I texted you so I wouldn't forget! For me, my work is my passion and I am fully engrossed in doing it. Be it any field, it is essential to do your work with full immersion so that you enjoy both, the process and the result.”

She also advises young people not to be bothered about money more than passion. While money does drive the world, following one's passion will eventually bring in money and satisfaction, which is the greatest wealth of all. “Another reason I think I am happy is because I'm not too much involved with social media. I see a lot of impact of social media on the psyche of the young generation. They start valuing themselves based on others' opinions. My advice for them will be to take it with a pinch of salt, believe in themselves & appreciate what they are by balancing their real & virtual lives.” She smiles with the wisdom of someone who knows better with experience & empathise with the ones who are still experiencing.

'There is no strong person with an easy past' is all one can think of as they get to know her story. Of course, life does offer good people and opportunities to all, but one can recognize those only when one knows what one wants. Dr. Mohanty's story is a lesson that self-belief works both ways - when we believe in ourselves, we get through difficult situations, and when we get through difficult situations, we get more reasons to believe in ourselves. She says, “My self-belief has empowered me to ignite self-belief in others as one candle can light many more! All that matters in the end is that we keep our faith alive in ourselves & don't give up.”







## The Resilient Optimist

*Dr. Nibedita Lenka*

“I sometimes think to myself that maybe I could have done better, but what I know for sure is that I've never, ever stopped trying”, she speaks with the voice that has persevered to make her dreams come true and wouldn't mind pushing through it all over again. With her unusual choices and even more exemplary results, Dr. Nibedita Lenka's story speaks to each and every person who has wished to walk the road not taken.

Born in Cuttack, Dr. Nibedita is the second among four of her siblings. Her father, Sri Shyam Sundar Lenka was an Indian Administrative Service officer of Odisha cadre and a strict disciplinarian who practiced duty as his devotion. “As a child, I grew up watching him always busy in his office work and files. He was immensely dedicated to his work and regarded all subjects as equal. Perhaps it was this that made him give us the freedom to choose whatever we were interested in,” she smiles. “Since my father had a transferable job, we moved from one place to another during schooling every year or two. That indeed helped us to broaden our outlook and we got the opportunity to see many places as well. While we imbibed honesty and sincerity from our father, from our mother (who passed away in an unfortunate accident in August 2002), we inherited simplicity and devotion. Both of them instilled in us the quality to remain true to our duty”, she adds. Due to her modest upbringing, she grew up to be a perpetually contented person. She was always happy with whatever her parents provided her. “My father used to say that his children were his real assets and no materialistic belongings would substitute that. Seeing my parents, I too became someone with no inclinations for any materialistic

pleasure. In fact, at times I got comments from some of my colleagues and staff on my dressing sense for not sporting contemporary fashion trend or style and I responded to them with a simple smile, without bothering about their comments,” she shares with pride and modesty.

As a student, Dr. Nibedita was always one of the toppers. Extremely passionate towards science since her high school days, she credits her teachers who not only taught her science, but also exposed her to the wonderland of scientific discovery and inventions. While pursuing her under graduation at Ravenshaw College, Cuttack, she developed fascination for Cell Biology, Genetics and Embryology dealing with intricacies of development. Furthering her interest, she picked Genetics and Cell Biology during her Masters' in Utkal University, Bhubaneswar- Botany with Cytogenetics as her special paper.

Dr. Nibedita believes she was most likely destined to pursue a career in research, for she was the only student from her batch to qualify NET and get awarded with JRF from CSIR. Taking her first steps in this arena, she landed up in the Genetics department of Osmania University, Hyderabad to get enrolled for Ph.D., under late Prof. G.M. Reddy's mentorship. This opened a world of opportunities she had never imagined, for she got exposed to tissue culture, the facility that very few laboratories in India had then.

As the doors kept opening one after another, Dr. Nibedita chose Temple University. After one year stint there, she moved to the University of Pennsylvania, Philadelphia, where she experienced the true spirit of scientific research. There she spent five long years experimenting with gene regulation aspects, as a postdoctoral research associate in the department of Biochemistry. After completing her pursuit in the US, Nibedita moved to Institute of Neurophysiology, University of Cologne, Germany to work on embryonic stem cells (ESCs) there. She then went on to build her scientific career at National Centre for Cell Science (NCCS), Pune as a senior scientist in August 2001. Since then, she has achieved countless milestones in the field of Regenerative Medicine and tissue engineering. Winner of the 91st Indian Science Congress Award in recognition of scientific achievements in 2004 and Samanta Chandra Sekhar Award for the year 2002, her collaboration with ANU, Canberra has helped her in identifying novel players through loss-of-function forward genetic screening and assessing the underlying mechanistic basis of action. In parallel, she is also working on 3D modelling of cancer and cancer stem cell, and studying the efficacy of phytochemicals and their nano-

formulations in combating glioblastoma both in vitro and in vivo.

But like all other triumphs, hers wasn't easy either. In her professional journey, she was confronted with the infamous Indian crab syndrome. "Being a practitioner of honesty and truthfulness, I never anticipated that science could have room for pettiness. In fact, soon after I joined NCCS, I could realize what sort of challenges I was going to face here. However, my positive attitude has helped me to get over most of those."

With all that wasn't going in her favour, Nibedita rejoiced the company of her students; but there were obstacles to that as well. "I was relatively young, and both students and staff used to feel comfortable interacting with me because of my friendly disposition. Some of the office staff members would approach me either for seeking suggestions regarding their children's education or asking for any personal help, saying I was more approachable and they would not feel that comfortable and talk freely with any other scientists here. However, some of my senior colleagues intolerant of me started targeting my students either instigating or misguiding them. In the beginning I ignored everything with the hope that it would pass. I was never used to confronting anyone, but in hindsight I realized my silence had cost me a lot. Hence, I had to learn how to speak out and stand for myself. Many a times, I would be either interrupted while asking questions during meetings or prevented from putting forth my views whenever I tried questioning regarding irrational demand and imposition. I managed to solve this by communicating through writing, whenever required," her story of slowly learning to fight is heart-breaking and inspirational at the same time, as this is a problem women face even to this day. She adds, "The period from 2011 – 2018 was the worst time in my entire professional career, during which the preponderance of favouritism and discriminatory treatment by the authority figures was at its peak and a couple of us were specifically targeted for various reasons. The communication with the head of the institute was next to impossible, since I never used to get an appointment to meet him in order to discuss any issues and hardly received any response to my e-mails either. Surprisingly, I had even got comments from one of the administrative staff here saying it's difficult to fight with power here and one should not develop enmity with a crocodile while in water. In fact, this was just opposite of what we had learnt from and the way we were brought up seeing our father."

When asked if she ever wanted to give it all up, Dr. Nibedita doesn't shy away. "At times

things had gone beyond my tolerance. I was indeed puzzled thinking whether I took the right decision in returning to India and joining here. I already had a green card from USA when I came here; I could have easily gone back there. I somehow chose to stay; maybe it was meant to happen so I could become tougher.” As she shares her ordeal, one can hear agony and triumph oozing in her voice at the same time.

Although society has hardly been that kind and considerate to single women, she gathered courage to face all odds due to her strong family upbringing. Because of her father's honesty, sincerity and straightforwardness, she found the strength to speak the truth to power. “Undoubtedly, the challenges that I have encountered during my professional journey transformed me from a meek and mild personality to a much stronger and bolder person. Now I do not hesitate anymore to speak out irrespective of being heard or not. Standing for the truth undoubtedly gives me a lot of mental satisfaction,” she tells proudly, adding a quote by Mahatma Gandhi, which carries deeper relevance in today's professional settings- “An error does not become truth by reason of multiplied propagation, nor does truth become error because nobody sees it.”

The resilient optimist that she is, Dr. Nibedita doesn't miss mentioning the roses she found on her journey. “I remember delivering a lecture during a meeting organized by Dept. of Science and Technology, Govt. of Odisha. That was the first time I spoke to any gathering in my home state, discussing about the basic biology and potential implications of stem cells. Since there were parallel sessions going on, once I delivered my talk, I was asked once again to deliver the talk on public demand, since the audience who were attending the sessions in other rooms wanted to listen to me again and know more about stem cells. This was one of the most satisfying experiences that I ever had in my professional career and this certainly boosted my morale as well, to do better in the field,” she recounts happily. As someone who treats her cells like her babies, she finds utmost solace around them. “When I look at them (cells) under the microscope, growing and forming many different patterns, many of which I still intend to solve, it does help me combat stress and in coming out with enough vigour to face all odds around,” she smiles. She beams with excitement recalling her interaction with Dr. A.P.J.Kalam during one of the meetings in Bhubaneswar organized by Dr. Singh of Imgenex India Pvt. Ltd. She reminisces, Undoubtedly, the short interaction with such a simple and exemplary scientist has left a lasting impact on me. He had encouraged me to explore the translational aspects of stem cells and help

people, citing then the example of doctors at LVPEI, Hyderabad, who are into restoring vision to people”.

Looking back, Dr. Nibedita's success has been an outcome of the choices she made from what life presented to her, and it is only through extraordinary choices that one can get extraordinary results. A believer of passion above ambition, she is extremely grateful to the people who encouraged her. “I feel lucky to have a supporting family to back me with my endeavour both at personal and professional fronts. When I opted for not getting married and rather pursue my passion for science as a researcher, I was never pressurized citing societal stigma. My father, who seemed tough outwardly, was quite emotional within, and all of what I achieved wouldn't be if it weren't for the values instilled in me by my parents and my elder sister's sacrifices,” she reminisces lovingly.

When asked what she would like to say to aspiring scientists, she simply says, “If one is passionate about something, one should follow the dream wholeheartedly and stay true to one's duty. Even though the path of honesty and truthfulness is difficult to lead, it is not impossible and the inner peace and satisfaction that we get by following these qualities cannot be replaced by anything else. We may encounter many overambitious people around us, who would always try to suppress us and pin us down with their selfish and opportunistic motives and vindictive approaches. However, we need to stand for what is right and positivity within us would help in making us mentally strong to march forward against all odds.”

Seeing Dr. Nibedita's journey, one can't help but cheer for all the accolades she has achieved, both personal and professional. It is also a textbook lesson for all those who shy away from standing up, thinking it will do no good. Maybe not immediately, but speaking one's mind does matter; if not to those above, it is an encouragement to those around to come forward and bring about change.





## Was it 'Meant to be' ?

*Dr. Jyotirmayee Mohanty*

It is commonly said that you are a reflection of your thoughts. You become the mirror image of what you think. One's thoughts are manifested as reality in the Universe. The energy you put in, comes back to you. On the other hand, destiny also plays an important role in your life. So whatever happens is considered predestined. A combination of both is what has happened with Dr. Jyotirmayee Mohanty, a scientist who is a name to reckon with.

“Scientist Jyotirmayee Patra”- you would find it written on the first page of all notebooks this curious little girl possessed in her childhood. Supremely inspired by an English textbook chapter on Albert Einstein, she would dream about discovering something new, something that would help the society at large. Dr. Jyotirmayee, now 'Mohanty', born on January 31st, 1971 in Chauliaganj, Matha Sahi in Cuttack, Odisha was the eldest of three children to a renowned Pediatrician father and a homemaker mother. Her father, Dr. Baikuntha Nath Patra being in a transferable government job, had to move to different places, resulting in the siblings being sent to different schools almost every couple of years. From Cuttack to Baripada to Keonjhar and Jajpur, Dr. Mohanty imbibed the learning environments from all these places. She remembers her parents being meticulously concerned about the kids' education, despite their frequent travel. She considers her mother, Smt. Tulasi Patra to be her first teacher, who taught her until the 7th grade and helped her build a solid foundation on which she built her career later on. She recalls always being passionate about Science and Mathematics. When she was in 7th or 8th grade, she read a chapter about the great scientist Albert Einstein in her English textbook. She was so inspired by it that an incessant enthusiasm emerged in her to discover something. “At that



time I used to write 'Scientist Jyotirmayee Patra' in my notebooks. I also used to participate in science exhibitions in the school and science quizzes in the college, and had received 1st or 2nd prizes in the events I participated," she gladly recalls. Immensely influenced by great teachers of her time, she chose to pursue Chemistry honours for her Bachelors degree. She says, "During our M.Sc., we had come to BARC (Bhabha Atomic Research Centre), Mumbai on a study tour for two weeks along with our professor. We got the opportunity to visit various chemistry laboratories there and interact with the scientists. By seeing the research work at the labs, in the short time we stayed at their Training School hostel, I decided that this was the place where I wanted to be for the rest of my life after M.Sc. I appeared for the All India entrance exam after my M.Sc. results came out in 1993, and cleared both the written and the viva-voce exam to get selected for the post of Scientific Officer 37<sup>th</sup> Batch Training School at BARC." As fate would have it, her dream was fulfilled and till date, she continues to live it.

Now-a-days, she carries out interdisciplinary research, combining her expertise in supramolecular chemistry with material science and its application in biology, laser science ( $H_2$  generation etc.) by collaborating with scientists from other divisions. "In our group, we have been persistently making significant contributions in frontier research areas of chemical sciences by establishing the construction and application of several novel stimuli responsive supra-molecular/bio-molecular assemblies as ON-OFF sensors, supra-molecular capsule, fluorescence enhancers, catalysts for  $H_2$  generation, drug delivery systems, nanoparticle conjugates, pH responsive systems,  $^{99m}Tc$  generator bed, antibacterial, antitumor and anti-fibrillar agents," she says. One of her publications recognizing the potential of nanoreactors/metalloenzyme models has been highlighted in the 'News & Views of Nature Chemistry.' Very recently, she and her team have demonstrated, for the first time ever, the application of a novel non-covalently held cucurbituril-heptamolybdate hybrid material as a generator bed for the facile and efficient separation of  $^{99m}Tc$  radiotracer, which is in demand for several theranostic applications. "In a significant contribution in the field of biomolecular assemblies, specifically for detecting and stabilizing telomeric G-quadruplexes as an anticancer strategy, we have established, for the first time, the application of fluorogenic dyes, ThT and Malachite Green, in dual role of inducing quadruplex folding in the 22AG human telomeric DNA, and sensing the same through its fluorescence enhancement," she says. A postdoctoral research fellow of Max-Planck Institute of Biophysical Chemistry and Jacobs University, Bremen, Germany, she holds numerous coveted positions at various societies of her field all over



the world. She has over a 100 publications in reputed scientific journals, at least “a dozen National & International Awards”, 3 book chapters and 2 patent applications to her credit. Recently she has been awarded the prestigious Homi Bhabha Science & Technology award, 2019, instituted by the Department of Atomic Energy, Govt. of India, for her outstanding contribution in the field of Supramolecular Photochemistry, Biomolecular Assemblies and Functionalised Hybrid Materials.

The picture from far off is not the same when you actually get to see its details from proximity. The journey was certainly not an easy walk for her. One of the early challenges she faced after completing the Ph.D. from Mumbai University was to go to Germany for her postdoctoral studies for two years, leaving behind her 2 years old son. It is never an easy decision for a woman to leave her family, for a mother to leave her child behind, when she is walking the road of success. Nevertheless, she got massive support from her family. “My husband, Dr. Rashmi Ranjan Mohanty, shouldered all the responsibility of my son and household in Mumbai, and rendered mental and emotional support to me to go for postdoctoral studies. During that period, my parents and in-laws also supported me a lot.” She acknowledges the contribution of her family with utmost gratitude. In her words - “My husband has been my pillar of strength since he came into my life. With him by my side I have never faced any problem in keeping the balance between my personal and working life as we share all the household work.” Even her mother-in-law has helped her a lot by staying with them for her son when she was away for postdoctoral studies in Germany. Her mother-in-law along with her son accompanied them to Germany when her husband acquired his postdoctoral position at Jacobs University, Bremen. She would take care of their son when both of them worked in their respective laboratories. Her son, who is an engineer in making at IIT, Bombay, is now her additional source of strength and support whenever she needs him. She says, “It is very much essential to have a support system when one is progressing in her career. I am grateful to God that he has given me such a wonderful family, who have stood by me through the thick and thin, and made my journey exciting and memorable.”

Did she ever feel like giving up? Did she ever want to pack her bags and go back? Yes! She says, “During my initial days in BARC, I was struggling for publications, whereas my friends had started publishing papers after one year of work. I got my first publication in the fifth year of joining BARC. I was feeling that I wouldn't be able to do good research work in my life and had a sense of failure in my early scientific career.” But it was the continuous mental support and

encouragement from her husband that she overcame her feelings and came out as a winner. However, she also gives credit to these five years of sheer hard work which helped her to lay a foundation, and her steely resolution to succeed irrespective of impediments. “During this period, I registered for Ph.D. at Mumbai University under Dr. Avinash V. Sapre (Ex-Head, Chemical Dynamics Section, BARC). With dedication and hard work, I could publish a good number of papers in international journals, and completed my Ph.D. within six years (1996-2002).” She recollects that one of her high moments was her first publication in *Angewandte Chemie International Edition* and a European patent with her postdoc supervisor Prof. Werner Nau. This gave her a huge boost in confidence to think independently and plan her work as a corresponding author in most of her subsequent publications. “Of course, as I went on publishing in good international journals, the recognitions came gradually my way in the form of being a referee to assess others' works in the field. That has helped me to expand my horizons, and evolve my scientific communication and quality of work over the years. Above all, my aspiration to excel in whatever I do has ensured wide acceptance of my work among the research fraternity.”

Not forgetting to specifically mention the contributions of the people in her life, she whole-heartedly thanks her son, Anwesh, who is her all time inspiration; followed by her parents, grandparents, teachers from school, especially Late Dr. Pitabasa Behera and Late Prof. K. C. Dash from college. She merrily reveals the monumental contributions of her husband, doctoral and postdoctoral guides, siblings, friends and colleagues at BARC. She has had continuous support from Dr. Ajit K. Mohanty (Director, BARC), Dr. A. K. Tyagi (Director, Chemistry Group, BARC) and Dr. J. P. Mittal (Former Director, Chemistry Group, BARC) for promoting her to carry out novel research in the field.

Besides science, watching old movies, cooking for her son and husband, and travelling interest her a lot. She also keeps herself involved in scientific outreach activities.

It is only reasonable that we ask her to enlighten the readers, especially young girls who aspire to be scientists, with a message. She says, “At any stage of your life, try to give your best, whatever be the results. Self-confidence is a pre-requisite for success. Don't stop dreaming and do not stop working. There is no alternative to hard work. Problems and difficulties, however daunting, will dissipate if you persevere. There is always a silver lining.” She vouches for looking at the bigger picture.





## Consistency is the Key

*Prof. Dr. Jyotirmayee Dash*

“Failure is a stepping stone to success.” No one can better prove this than Dr. Jyotirmayee Dash. Her success has been much appreciated, but what made her what she is today is quite an inspirational story.

Born to reputed school teachers, she grew up in an atmosphere of teaching, learning and discipline. The eldest of three siblings born in a small village, called Manapur in Jagatsinghpur's coastal region of Odisha, Dr. Dash shared an amicable bonding with her family and friends. She happily recalls that there was never a bias and she was treated equally in the family. Amazed by the nature and its wonders, she was always curious to explore and hence she chose to study science. Soon enough, she developed a fascination for chemistry as she could visualize its role in daily life. Interestingly, love for organic chemistry took roots in her mind and she ended up pursuing chemistry honours for her Bachelor studies, subsequently pursuing organic chemistry for Masters at Ravenshaw College in Cuttack. “My family, school and college teachers sparked a scientific interest in me for higher studies. I was interested in creating new molecules,” she says. This is what led her to go for doctoral studies in the area of organic chemistry at the Indian Institute of Technology (IIT), Kanpur under the able guidance of Professor Faiz Ahmed Khan. She continued her postdoctoral research in Germany, France and the United Kingdom, along with several leading scientists of the field, with the same zeal.

It was only at IIT Kanpur that Dr. Jyotirmayee began her journey as a researcher. There

she gained expertise in a wide range of organic chemical transformations. Reminiscing about the early stages of her Ph.D., she says, “Many experiments were unsuccessful. For the first time I was learning how to carry out the experiments. I was so enthusiastic about the learning process that I used to spend most of my time in the laboratory. By carrying out experiments repeatedly and gaining exposure to scientific research like writing research and review articles, I improved my skills and raised my confidence.” It is quite evident that she had learnt the importance of hard work and dedication in research. Even with all these failures initially, she never gave up on her enthusiasm and curiosity to unveil the nuances of nature.

She was already on the path of success and there was no looking back. After the completion of her doctoral studies, she was awarded the Alexander von Humboldt Fellowship to work as a postdoctoral researcher with Professor H. U. Reissig at Freie University in Berlin, Germany where she worked on transition metal catalysed transformations to synthesize biologically heterocyclic compounds. Further, she moved to the École Supérieure de Physique et de Chimie Industrielles (ESPCI), one of the most prestigious institutions for higher studies in Paris, France that stands out for its high level, interdisciplinary and research based science education that blends the fundamentals of science with a strong focus on applied aspects and innovation. She worked there as a part of the research group of Professor Janine Cossy, conducting research on multi- step synthesis of natural products. As she counts her fortunes, she gleefully mentions another feather in her hat. “During this time I received the prestigious Marie Curie Fellowship to work with Professor Sir Shankar Balasubramanian in the University of Cambridge. During this period, I had grown a keen interest in nucleic acid research.”

“With a varied expertise, I have been motivated to explore interdisciplinary research in Chemistry and Biology. Our research uses organic chemistry as a tool to study the structure and function of nucleic acids,” she says. She has played a key role in developing new tools to synthesize molecules that can selectively interact with nucleic acid targets for therapeutic applications. To state an instance, DNA secondary structures are present in the promoter regions of cancer causing proto-oncogenes. By selectively targeting DNA secondary structures by small molecules, gene expression can be inhibited. Dr. Dash and her team have developed molecules that can selectively bind to DNA secondary structures and modulate gene expression in cancer cells. These compounds can selectively kill cancer cells and are non-toxic to normal cells. They have developed new methods to synthesize selective ligands for DNA and RNA structures.

They have also developed molecules that can selectively bind to TAR RNA, present in HIV-1 virus. They have also used nucleic acids and their components to form artificial channels for transportation of metal ions across the biological membranes. Further, she has developed new methods to synthesize biologically active natural and unnatural products.

She is one of the brightest and youngest scientists Odisha has seen so far. Her research publications have been highlighted in newspapers, media, Organic Chemistry portals and journals of repute. She has more than 100 research publications, 2 book chapters and 6 patent applications to her name, as of now. Her wall of fame proudly holds the Shanti Swarup Bhatnagar Prize (2020), the DBT/ Wellcome Trust Indian Alliance Senior Fellowship (2020), Fellow of the Royal Society of Chemistry (2020), just to name a few. She has been a council member of the National Organic Science Trust that nurtures and promotes research in organic chemistry in India. She has also been serving as the Advisory Board Member of numerous international journals of chemistry. She is currently a Professor at the School of Chemical Sciences, Indian Association for the Cultivation of Science in Kolkata.

It is not easy to achieve all of this at such a young age. There come enormous challenges that one faces, pulling one down from where one wants to reach. This pressure bulldozes many, but not in case of Dr. Dash. She has had her own share of lows. Quoting her, “There are always ups and downs in life, but the quest of knowledge always kept me moving forward and I never got demotivated as my motto was never to give up in the face of adversities.” Another aspect that always keeps her going is to see her students do well. “One of my passion is to teach and train young and budding scholars. It is quite rewarding to see my students receive their Ph.D.s and several of them have transformed into postdoctoral researchers, industry and academic professionals.” Furthermore, it does take an extra toll on women in science to maintain a work-life balance. One needs perseverance to be successful in academia and log in long working hours in the laboratories. It is not possible to dedicatedly work as a researcher, with all the stresses, deadlines, meltdowns and fiascos, without the support of one's family. “My parents and my husband have been endlessly supportive of my studies and professional career. The sacrifice of my children also helped me to devote long working hours necessary for academia,” says Dr. Dash with a sense of gratitude.

When asked about what she would consider as the turning point in her life, she goes back

to remember the wondrous times of her Ph.D. at IIT Kanpur and the years of her postdoctoral research period at Cambridge University, where she got the opportunity to work with scientists of eminence, be under the supervision of excellent supportive mentors, and carve a 'Scientist' out of her. This training of hers over the years allowed her to establish her own independent identity as a researcher in the fields of Organic and Biomolecular Chemistry.

She molds lives by pursuing her passion to teach undergraduate and post graduate students. She enjoys delivering lectures at national and international conferences, and in the times of the pandemic, webinars are her go-to option. She has been doing so at colleges, institutes and universities throughout India. She is specifically involved in infusing a scientific temperament of research in younger students and scholars. Outside of academia, she appreciates Classical music and wishes to learn Rabindra Sangeet.

Living life as it comes, she definitely has some pearls of wisdom to impart to the younger generation. “I would like to suggest young students to remain calm and positive in all situations. Life always has a risk of changing at any moment. One should learn to be adaptable with whatever life offers; we must always flow like water. From my experience, I wish to share that the essence of hard work, determination and honesty are the pillars of success in life.”

Given all the disparities and the spontaneous nature of the universe, the path of everyone's life shall take a different course. Nevertheless, if one sticks to consistency and hard work, using one's failures to learn from them, success will definitely come to one.



## About the Editors

**Dr. Sanghamitra Pati** is the Director of ICMR-Regional Medical Research Centre, Bhubaneswar. Being a doctor, a renowned medical researcher and an expert in public health, she is a well known face in the world of medical research and science communication. She has been named among the top 2 percentile of medical researchers of the world. She has more than 20 awards of national and international repute to her credit. She has authored and published 2 books, more than 10 book chapters and hundreds of research publications.

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**Dr. Banamber Sahoo** is presently working as Library & Information Officer and Head of Library, Information division, ICMR-Regional Medical Research Centre, Bhubaneswar. After completing B.Sc ( Chemistry), he did his Bachelor in Library and Information Science in 1986, then Master in Library and Information Science in 1988 and was awarded Ph.D from Utkal University, Bhubaneswar in LIS in the year 2000. He has more than 30 years of experience as a Librarian and has published 12 publications.





# Odi-Sci

## The odyssey of the women scientists of odisha

‘Odi-Sci – The Odyssey of the Women Scientists of Odisha’ takes the readers through an emotional chute-the-chute of giggles and tears, silence and sighs, upsets and reliefs. It’s common to applaud the excellence and achievements of a person, but looking behind the scenes is often ignored. The book is an effort to document the actual lives of the daughters of Odisha who have excelled in various fields of science. Not only it diarizes the high points of their career but explores the struggles faced and the bottlenecks overcome by them, both in their professional and personal lives.



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ISBN 81-955532-0-6

