The Sen Lab enjoy the Labour Dat weekend at the park.

PHOTOS: COURTESY

A conversation with Professor DEBATTAMA SEN

Meet the Bangladeshi researcher who leads a lab at Harvard

It was a rainy day in Dhaka, with the afternoon's heavy pour already transformed into a drizzle, as me and Debattama Sen sat in front of our computer screens, almost 7,700 miles apart. Having to interview a Harvard faculty member , and one of the leading researchers in the field of biological sciences was a mammoth task—one that I was particularly intimidated by.

HRISHIK ROY

I got the ball rolling by asking one of the most basic questions: What does an average day at work look like for her?

She explained that as she is an Assistant Professor at Harvard University and also leads an immunology laboratory at Massachusetts General Hospital (MGH). Since MGH is the original and largest teaching hospital of Harvard Medical School, the work of the faculty there differs from a traditional academic appointment. Unlike a traditional academic position, which would require one to both teach students for at least nine months a year, 95 percent of her work involves research. "A typical day involves going to the lab, meeting with my trainees including graduate students from Harvard, meeting with other professors, collaborators, writing grants, writing papers, and thinking about the data," said Professor Sen.

It is often difficult for people outside a particular field to understand and comprehend the work of an individual in it, and I was no different when it came to Professor Sen's work, and the real-life implications surrounding it.

Upon asking her to elaborate further on her work, she broke down how it involves the immune system of the body. "The thing that I have always found interesting about the immune system is that it deals with a variety of threats, but somehow finds a balance. High levels of activity from your immune system is bad. For example, when someone dies due to COVID-19, it's usually not because the immune system failed to clear the virus, rather, it is because so much damage was done in the process, that there were some downstream negative consequences to the body. So, my lab is focused on studying white blood cells in the immune system, particularly trying to understand why the immune system can be successful at dealing with certain acute viruses like the flu, but fails to control chronic viruses like HIV or Hepatitis-C," explained Professor Sen.

Professor Sen further added that they also research on how the immune system responds to cancer, which might surprise some as they expect the immune system to fight viruses entering the body rather than something like cancer. "In a lot of ways, cancer behaves like an external pathogen to the immune system because it shouldn't be there and it is something that will damage our body. So, our T cells and our immune responses are always trying to fight the cancer, but is usually unsuccessful with its efforts. In the last decade, many of the major drugs against cancer are immunotherapies. These immunotherapies help strengthen our immune system to fight the cancer. So, I would say that my lab is trying to cure disease by re-creating a functional immune response, that we see for viruses such as influenza, in the context of a chronic viral infection like HIV or cancer."

I was also interested to learn about how she discovered her love for the field. In response Sen told me that she had somewhat of a "meandering journey."

Growing up in Bangladesh, her favourite subjects were physics and chemistry, especially because her teachers at Sunbeams taught the subjects in a very inspiring and amazing manner. "So, I thought I was originally going to be a Physicist. When I finally got into college, I realised that I liked things that I could put my finger on. And, in physics, you can only really visualise some of the things you are learning. That coupled with the fact that boundaries in physics are very abstract, it dissuaded me from pursuing it. I wanted to pursue something where I could see the impact of my work, and to me that felt like biology. In biology you can, unfortunately, put your finger on human suffering, with the number of people dying of cancer or the number of people who are dying of viral diseases. So, I kind of had to redirect myself a couple of times to end up in this field. But I love what I do, and am grateful to be doing it every day."

While talking about her journey in academia, she advised that everyone should always have a back-up plan in case things do not work out the way they envisioned it. "I think there is an American concept that you should follow your heart. However, as a Bangladeshi, and also an immigrant, I was scared to fully take the leap into one field. So, I dealt with this feeling by adding a minor to my degree, that would help me get a job no matter what. The worst-case scenario would be that, no matter what happened, I could join Google and become a faceless programmer like the thousands they have there."

When asked about who inspired her on her journey, Professor Sen shared that her father—who is Research Director at Bangladesh Institute of Development Studies (BIDS)—was the first person she looked up to as an academic. She reminisced about how she used to help find typos in her father's grant applications during her childhood, and how that always connected her with his work. Sen also mentioned how her mother was a "deeply technical thinker", who had a knack for problem solving. "My parents were, honestly, the first people I saw as problem solvers and visionaries. Then, as I got older, the people who really inspired me were the mentors that I had, and that's where I consider myself lucky. You see how hard these people work and how much they enjoy it. That inspired me the most, as I did not just want a job, instead I wanted something that I could love doing every single day."

In our hyper-competitive society, we are often told that those who are the top of their classes, in school and university, are the ones most likely to succeed. So, I posed the question if Professor Sen had always been a class-topper. Recollecting the memories of her childhood, she told me that while she was usually one of the top ten students in school, she was never really at the top of her class. "I never really cared about success for the sake of it. So, while I would never get a 100 percent in any subject, I would get a 95 percent, there was always a five percent which I could have gotten with a little more effort," said Sen.

Professor Sen had left Bangladesh when she was only 13-years-old, I was very intrigued to learn about her initial experience in the US. She noted that the transition was not as smooth as she had hoped. "You have to adjust to everything. For example, in Bangladesh, you have a full name and a nickname. So, my full name is Debattama Sen, while my family calls me by my nickname, Tumpa. In the US, this is uncommon. While they have nicknames at times, usually it is just a shortened version of their first name. So, in the US, I went from being Debattama

Sen or Tumpa, to Deb, as people don't like saying a long name. Moving to a country, where your culture is stereotyped is extra hard. I am embarrassed to say, there were times when I had to say that I was from South-Asia, because I wasn't sure they would know where Bangladesh was, and where I was actually from. But you deal with these things and hopefully, they make you stronger. Always try and hold on to who you are."

When asked if she missed anything specific about Bangladesh when she moved to the US, Professor Sen said that she definitely misses Bangladeshi cuisine, especially the sweets. She also mentioned how she missed the various cultural aspects of Bangladesh, such as celebrating Pahela Baishakh or wearing yellow during Pahela Falgun.

Given that STEM is a very cis-male dominated field, I also wanted to learn about her experiences as a female individual from a different country in the discipline. She recalled her experiences about how she had a difficult time finding people who would do group projects with her.

Elaborating on the issue, she explained, "When I started out in grad school, anyone in my classes could tell that I was very passionate and very expressive. But eventually I noticed that I was the only girl who asked questions. Our class comprised of six boys and four girls, so it was a small and well-balanced PhD cohort. One day, I remember a girl remarking 'Oh man, you talk so much!'. It hurt that a classmate of mine would say something like that. I always say that you have to take the world as it is, not as what you wish it to be. You have to sort of compartmentalise - if I only focused on the negative, I would never get out of the bed and walk out the door to get to my classes."

Professor Sen is also a reviewer for many scientific journals including Nature, so I asked for her insight on the gatekeeping of scientific knowledge through the use of paywalls. She noted that it was somewhat ridiculous, because the funds for her labs came mostly from taxpayers through the NIH. Professor Sen said that she never needed to pay for scientific journals, as she could access it with the help of her institute, Harvard, while the people who actually end up paying for it are ordinary citizens. "What it creates, I think, is this inner circle of the people who can always access everything, while people on the outside cannot access any of this information. So, I find it really outrageous."

Upon asking her thoughts on being a better science communicator and how teachers could instil the love of science within their students, Professor Sen explained that she believed teachers need to move away from the age-old methods of memorisation, as we now live in times when any information is very easily accessible. She suggested that teachers can get rid of this habit by teaching without a textbook.

While she acknowledges the fact that it is much more difficult to teach without a textbook, she thinks that it is much more fruitful in terms of communicating the subject material to students. "If Bangladesh wants to play in the international academic field, it has to keep up with the kind of critical thinking that international students and scholars demand. So, we have to change if we want to compete."

When asked about the most notable moment in her career, Professor Sen said that it was difficult to pinpoint one particular moment. However, she described a particular type of moment that she loves, "There is a point when you find something never seen before. I remember when I was a grad student, I had looked into the microscope and I saw something that was potentially interesting. And, I remember walking down the corner, to my PI's office, excited to tell him about it and thinking 'I might be the first person in the world to know this.' That feeling, and how you feel so protective about it, is what feels momentous and addictive for me."

I was also curious to find out how she manages to unwind and prepare for the demanding roles she has to take on. Professor Sen responded that she enjoys skiing, and it is something she looks forward to during the harsh and cold winter of Boston. "I'm also grateful for the endless support from my spouse Sean McCanty who has not only taken over more than his fair share of household work, but always plans interesting adventures and trips as a break from work for us," said Professor Sen.

She also enjoys cooking, and is inspired by her mother. Among her favourite dishes to cook, is khichuri—especially when it rains. She also enjoys relaxing out in nature, as it gives her the opportunity to unwind from the demoralising aspects of the world in which we live in.

Professor Sen also added that she listens to a lot of Rabindra Sangeet, and refers to herself as being "a real traditionalist" when it comes to music. However, she said that she has been recently trying to diversify her music taste by listening to reinventions of the classics.

While talking about her taste in music, Professor Sen recalled how her stint in dancing had influenced it. "I like songs that have an interesting beat, something like jazz that has interesting rhythms." She recalled how she had grown up dancing Bharatanatyam, and had also appeared as one of the girls dancing in Humayun Ahmed's Dui Duari. "It was just amazing, because it was two days of filming and I got to meet him [Humayun Ahmed]. He was truly larger than life."

According to her, she had started dancing from the age of four or five, and had participated in televised shows while she was in Bangladesh. When she went to the US, she practised dancing under the tutelage of Daya Ravi, who was classically trained. "It really taught me discipline. I think dancing helped me get into college, as I was not very organised, so dancing forced me to bring structure to my life," added Professor Sen.

Finally, I wanted to learn about her advice for the Bangladeshi youth. To answer this, Professor Sen took a moment to think before she said, "Look, success in life is, at least in my opinion, a combination of three things: you have to start off with the right skills, you have to be lucky and you have to work hard. So, what I recommend for everyone, particularly young girls, is to live up to their potential and find a thing that they are good at. This is very important, so that when luck comes our way, we can take full advantage of it. At the same time, my advice for everyone is to have a backup plan or some sort of safety net. Ultimately, you have to try to swing for the fences!"

Hrishik is going through a quarter-life crisis now. Send him help at hrdibbo@gmail.com