



## The ALBA Diversity Podcast

### Season 1- Episode 11

#### Dr. Suraj Honnuraiah - Facing discrimination in Translational science

##### Speaker Key:

SM Shruti Muralidhar (Podcast host)

SH Suraj Honnuraiah (Guest)

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SM Hello, and welcome to the ALBA Diversity Podcast. An ALBA Network undertaking to profile and highlight diverse and immigrant neuroscientists. We talk to neuroscientists across positions, career paths, and backgrounds, to better understand their personal journeys. We showcase the grit and determination it takes to overcome hurdles they face as part of underrepresented or minority groups. We also talk about what keeps them going as individuals and as neuroscientists in today's world.

So, today, we have with us Dr Honnuraiah. He works as a postdoc in Australia National University. The floor is all yours.

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SH Thank you, Shruti. And once again, thank you very much for the opportunity. Yes, so, I am currently working as a postdoc with Greg Stuart, here at Eccles Institute of Neuroscience in Australia National University. And I recently finished my PhD with the same group where I worked on binocular visual processing in rodents, using optogenetics and cellular electrophysiology approaches. Both in-vitro and in-vivo techniques.

This all started when I was growing up, in high school, I think, one of my friends at that time had a road accident and he actually lost his vision. This is my first introduction to neuroscience, which intrigued me to think about the brain and what it does in a more broad sense. And this is what I started to think that there is much to this part that is sitting in our skull. During that incident, I spent a lot of time looking at what kind of solutions were available, and I was frustrated when I was at the doctor's and discussed these issues. They didn't have any solution.

So, when the time came to decide what I would do, I had to choose between engineering and medicine. And I chose engineering, to focus on electronics, circuit design. My idea at that time was if I could build a chip that could be implanted into the visually impaired people, it should perform as our visual cortex, for example, does. And be able to restore vision. So, that was my idea. It was not possible if I had gone through medicine. So, I decided that this would be a good approach.



And then, I had to face a lot of other challenges once I started working on this problem in my engineering undergrad.

Not many people working in engineering have a mechanistic understanding of the brain and the neurons, for example. So, it was really hard for me to understand the concepts of how to translate the function into the hardware. I visited a lot of hospitals during this time to get more information from the doctors.

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And, again, I was not getting what I wanted. Because they didn't really understand what was going on in the brain. Because I wasn't able to progress in this, after finishing my undergrad I started working in an electronics design company where I would spend some time to understand the basics of building a chip from scratch. At that time, it seemed like a good choice. But then, I realised that I didn't want to go in that direction. So, I quit my job in six months and then started looking at positions within India which would give me some training in neuroscience.

During this time, I came across a paper from Rodney Douglas, with whom I ended up doing my master's. He was a pioneer in translating neuronal circuits onto hardware using analogue chips. And this was something that I wanted. And I was completely surprised, because all the function was described in terms of analogue circuits. And this language, I could understand.

And then, in order to get a more biological foundation, I moved to a short research position in the Indian Institute of Science. At that time, Professor Rishikesh Narayanan had recently set up his lab. And he was also trained as an electronics engineer. So, when he moved to neuroscience, I completely understood what kind of training I was looking for. I wrote to him, and then he immediately asked me to come to his lab. And then, that's how I started working seriously in neuroscience. So, there I worked on computation problems, but nevertheless, it provided a solid foundation in terms of neurophysiology that is required to understand neuron function.

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SM That's really fascinating. A lot of biologists come the biology way. A lot of psychologists come the psychology way. I feel like stories like this are not told as often, and I'm really glad that we are having this conversation. Because computation and neuroscientists come from very different backgrounds. And it's nice to see how you managed to talk to people who mattered, and then they referred you to the people that they thought were important for the questions that you were asking. And I think that speaks a lot to the kind of people you are working with. And that's really nice.

SH Yes.

SM Is there somebody very specific who you think is an excellent mentor, or has been or is a mentor who guided you through a lot of things?

SH During my undergrad, my supervisor there, who was working on chip design, her name is Uttarakumari, she was Head of Department at the time. So, I have been fortunate to meet the people at the right stage who would go out of their way to



help me, both in terms of progress in science as well as personally, to make choices that would lead to achieving my dreams and goals.

Rishikesh Narayanan is one such person, in the Indian Institute of Science. Because I was completely inexperienced, and he took me on and had the patience to train me. And made me realise that it's important to ask the right questions. So, that was something that I've learned through my mentors.

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I've been fortunate to work with my role models. And I approached them, and then I went to them, and I've been able to work with them as well. That's another part which I think played an important role. For example, Rodney Douglas is one such person. And he was trained as a medical doctor and a self-trained neurophysiologist. And a pioneer in neuromorphic engineering. And his approach to science has influenced me a lot, to think about problems in a very specific way.

And also, my current supervisor, Greg Stuart, is also one of the pioneers in describing single neuron function at a very detailed level. And he described a technique to record from dendrites. These are the thin branches that receive inputs, which we didn't previously know had such computational abilities. After I did a short stint at the Indian Institute of Science, I moved to Master's in Neural Systems and Computation. This was a joint programme between ETH and the University of Zurich.

Their goal is to understand the biology, and then develop artificial intelligence machines and circuits that would mimic the biology. And this was perfect for me. And Rodney Douglas was there, and I went there to work with him. I spent most of the time building abstract models, these point neuron models, and trying to understand abstract computation. And I finished my master's and started my PhD with Rodney. But he was retiring at that time. And we had to obtain funding from other sources.

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So, at that time, IBM was developing a chip, called TrueNorth, where we could implement up to 1 million neurons on a single hardware. And I thought this is a perfect platform to test some of our findings that we have obtained from the biology. And wanted to implement this on a large scale model, and try and understand if we can make a context-dependent processor, which would process auditory information on cue, or visual information, or some other sensory. But IBM, at the time, were not interested in this kind of biologically-oriented approach.

But because Rodney was very much interested in translating this, I had very strong support from him. But this struggle, internally, for me, because this started at that time when I started investing more into the biology, and I started realising that what we were doing was not right and I should focus more on the biology. So, I applied to Greg, and I moved from Switzerland to Australia. And started on binocular information processing in rodents. And I've been in love with electrophysiology ever since.

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It's close to my heart. As a fellow electrophysiologist, it's so nice to meet somebody else who does something very similar. But I'm glad you found something you enjoy



doing within neuroscience. And that's really the key. Since you mentioned moving from Switzerland to Australia, well, also from India to Switzerland in the beginning, I thought maybe you could shift gears a little.

Do you consider yourself to be part of an immigrant or a minority group? And then, have there been times where you've faced some sort of discrimination because of this?

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SH I do consider myself as a minority. Because not many of our people are doing neuroscience. This is relatively new. And when we go into the lab, for example, it's only one or two, maybe, from our ethnic origin to be working in this field. And this is, I think, improving a lot. Because lots of people are becoming more aware of this field. And now I see a lot of students from our ethnic origin also pursuing PhDs and master's more and more. But then, at that time, and also the fields I had chosen were so interdisciplinary, and it's either you would find people completely in the engineering front or in the biology. But because I was working at the interface, I didn't have much company, in that sense.

And yes, in the beginning, it was difficult to fit in. Because you don't see people like you around, it's just harder to feel like you're a part of the neuroscience community. And when I first moved to Switzerland, I felt that pretty strongly. But the labs that I worked with, fortunately, were very good in accommodating diverse background people. So, Rodney, I think, made an effort to have a very good and open lab space. It was based on the merit, not on the background. You could discuss ideas, and everybody was welcome.

But then, when I go to gatherings, for example, scientific meetings, I have faced biases. In order to be taken seriously, you have to do more compared to your fellows, for example.

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SM Yes. The scale is different, right? It's not very explicit also, I feel. It's a judgment, and it comes rarely, but...

SH When I'm presenting my work, in order for them to look at the work seriously, it would take a lot of effort from my end to convince that I am worthy of doing these sort of experiments.

SM It's not just worth, but most of the time I feel like most people who come and see or listen to your work can't believe that you've done this.

SH Yes, exactly.

SM It's such a hard sell. Because you're like, how can you not believe? My name is up there. My lab is up there. I have been in my lab. You see I'm a grad student. And somehow, there's this sense of disbelief where they're like, you did this? Really?

SH Yes, yes. Even though I have worked for several years in this, that notion still hasn't changed. And that bothers me. And also, it's sad that that is the case. But in terms of the labs itself, I was very fortunate to be part of these groups where



they have worked with people with different background. I think that is important. And they are more encouraging in terms of when I experience such a thing at a conference, I would be discussing with my supervisor, and they would be understanding. So, that was very important.

For example, my recent SfN experience. So, I was standing at my poster, and when people would pass, when they look at me standing in front of my poster, they don't really come to my poster.

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But what I realised is when I was not at the poster, when they were looking at the content, they were really interested. So, when I was not standing at my poster, I saw that there were lots of people going to the poster, and then reading it. But when I'm standing, they would just assume, maybe. I don't know what goes on, right? And they just leave..

SM Yes, I'm glad you're talking about it. Because these are the things that are hard to talk about. And then, when you go back and think about it, at the end of the day, you're finished, you're done with your poster. You're sitting with your friends, you're having a beer, and everybody's talking about, oh, how many people came to your poster? And you're sitting there wondering, really? Did that many people come to my poster? I'm not even sure. And you can really doubt yourself, right? It makes you doubt yourself, it makes you doubt your work. And that's a very implicit, very subtle bias.

SH Yes.

SM I'm glad you voiced it. Because I feel like I have experienced it in some form or another, too. I feel like it's hard to describe, it's hard to quantify, and it's hard to voice. Because the instant you voice it, it feels wrong. Like it's probably not true and you're just making a big deal out of it.

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SH Yes. I thought I shouldn't complain. It is seen as complaining. And I just assumed that I should just keep my mouth shut and then, just work really hard. But I find that those two are not dependent on one another. Because if you want to judge someone's work purely on their merit, then they should get rid of these preconceived biases. And again, as you said, it's really hard to quantify what really goes on in these kind of scenarios. Because when I'm a group, when I'm in the lab, when I'm in the department, I don't experience this at all. Everybody knows how each of us work, and they have respect. Even though we work on different problems, we respect each other. And that's important.

And within the labs, I think, within the department, I have never faced this problem. Because everyone understands this. But my experience in this is when I go to these meetings, as I said, like these huge meetings and SfNs, which I think is one of the biggest meetings for neuroscience. And there, I was disappointed that this was there.

SM I know you mentioned this earlier. But I'm just going to dig it up a little. You mentioned having worked in Rodney's lab and Greg's lab, having a boss who



respects diversity, or having somebody who recognises the importance of diversity, has that done something good for you? Have you seen a good outcome of having diverse thoughts, diverse people, people of different backgrounds?

SH Yes, absolutely. Because they would be much more understanding in situations which would not directly make sense to them. Also, having a person with my background would help them, for example, certain situations are specific for our culture, right?

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For example, we are very attached to our parents.

SM We have very strong family ties.

SH Yes. In Rodney's lab, for example, we had someone from Spain, at the same time as I was doing my master's. And even their culture is similar to ours, I would say.

SM Absolutely, you're right.

SH And when we say, we needed a day off to contact the family or any such things, then they would be very understanding. This is just one example from my experience. I felt that having a diverse work group within the lab is also very important. And it has certainly helped me to have this balance with my personal life and the things that I do in the lab. And the understand, if my progress has not been optimal, for example, and the reasons are not something that they could completely understand. But they have been compassionate. And things like this, which are important.

Because it's easy for one to, when they don't understand something as a norm, they could easily dismiss it. And then, it would have negatively impacted on my growth as a scientist. Because sometimes, it's very hard to disassociate the personal aspects with the science we do. And having an understanding environment and a supervisor, I think, is very important.

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SM As you say, having diversity is so important to build empathy. And empathy is definitely in short supply in general all over the world, but in science for sure. Everybody is answering tough questions. It's a hard slog. We all have hard working hours. And we all do difficult experiments. And not everyday is amazing. And you're right, having somebody who can empathise with you on the fact that, oh, it was a tough day. Or you didn't have a great conversation with the family. Or something is up in your personal life. It makes a huge difference.

SH And that was the impact of having a different ethnic origin. But then, scientifically as well. Like if you think of a problem with a different approach, for example, when you're trying to understand a simple data set, you can look at it from different perspectives. Having this diverse work environment, in the sense of each of them are working on a common problem, but they're viewing it from different lenses. Like using biology, someone is using mathematics, or using engineering, I suppose. So, having this is also very important, in my experience.

And some problems, it makes sense from a different perspective. And having a



different approach also is critically important.

I think the questions that you've raised are important, especially for people coming from a minority background. And it's good that we talk about these issues, which go unnoticed in academic settings.

SM I'm really glad you feel that way. It's a growing movement.

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I don't know how many people were aware before, but I'm glad that even the people who are aware are standing up now to talk about it. And I think it's very important.

SH Yes. When I experienced it first hand, it was strange. And I didn't know if that was the norm, or whether I could speak against it. But then, when I see that happening to my younger colleagues, I see the importance of speaking out. And it makes a lot of difference in terms of not only our confidence to move forward, but also having a good environment where everything is discussed openly and freely.

SM Definitely. It makes the science we do more enjoyable, and that much more important.

SH Exactly.

SM Thank you for listening to this episode of the ALBA Diversity Podcast. To know more about the ALBA Network and its activities to promote equity and diversity in the brain sciences, please visit [alba.network](http://alba.network). You can also register as a member for free, and take full advantage of the network's resources. For more details, follow the Twitter handle [@network\\_alba](https://twitter.com/network_alba), or [AlbaNetBrain](https://www.facebook.com/AlbaNetBrain) on Facebook.

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