

## **Young Scientist Spotlight 11: Oluwasegun Akinniyi**

### **Intro:**

Stella: Hi listeners, welcome to Carry the One Radio (whisper: the science podcast). I'm Stella Belonwu, and I'm here with another entry for our Young Scientist Spotlight Series. In this series, we interview grad students, postdocs, and other young scientists to learn about their research, hear their stories, and listen to their ideas for how we can fix issues facing the scientific community.

For this episode, I had the pleasure of interviewing Segun Akinniyi, a bioengineering masters student at Obafemi Awolowo University in Ile Ife, Osun State, Nigeria. We talked about everything from his research and how his identity influences his experience, to his love for nature and traveling, and his plans to change the landscape of research in Nigeria. Stay tuned!

### **CTOR Tag**

#### **Segun's road to research, and current projects**

Stella: Hi, it's so great to have you as a guest here on CTOR. Can you introduce yourself to our listeners and tell us a little bit about what you do

Segun: Okay, um, I'd Segun Akinniyi, um, I'm a graduate student in Dr Ayodele's lab, which is a bioinstrumentation and neuroengineering laboratory. Um, in the department of electronics and electrical engineering in Obafemi Awolowo University. Um, I'm completing my master's degree, and I'm working on the development of an upper limb stroke rehabilitation robot. That's what I'm doing.

Stella: Very Interesting! So, how did you get interested in this? What was your educational trajectory?

Segun: Um, since I was very young I'd always known I want to be an engineer. If I could remember, since the age of seven. I had this makeshift workshop that my dad drops, um, radio sets and TV set that have damaged and, um... So since then I had no issue going to science class in high school. From there I went to the polytechnic, um, all to study engineering but I got to know that I could be trained as an engineer in the polytechnic so I switched to the university (laughs) where I started, um... I went for a bachelor's in computer engineering and, um, it's no coincidence that I'm back here again for my master's in, in engineering in the same field, but with more application in medicine now.

Stella : Yeah, so what did you mean you couldn't study engineering at the polytechnic? Like, what did... What, w- what... Explain what a polytechnic is. I know like, I've heard that word a lot of times and I was wondering what it was.

Segun: Yeah. Yes, um, the p- polytechnic setting is mainly for technical education and, um, it's a two years diploma... The lower diploma and two years for higher diploma. So even if you spend the whole of four years in the polytechnic you will be trained as a technologist, um, not as an engineer. So I didn't know until I (laughs) got there and I discovered, um, I'm getting trained to

be a technologist so it's mainly a technician for the first two year diploma and the higher diploma is to be a technologist. So engineering degrees are offered in university. Yeah, that's, that's how it is

Stella: That's interesting, thanks so much for clarifying. So to circle back um, you're working on this stroke rehabilitation, um, device now?

Segun: Yeah.

Stella: How long have you been working on it? Like, you said this is a master's program?

Segun: Yeah. Um, for about two years now, I have been working on, on, on the project.

Stella: Mm-hmm (affirmative).

Segun: It's been a year for course work and one year for research so tentatively for two years

Stella: Okay, um, so what does a typical day look like? What does the work entail?

Segun: Um, about the year before now, um, I was splitting my time between coursework and, um, and going for rotations in the teaching hospital because I needed to get domain knowledge in neurology and physiotherapy. Um, but presently I spend most of my time on my PC, um, working on my thesis and, um, I'm working on some manuscripts with my supervisor. That's what I'm doing presently.

Stella: Oh, cool. Um-

Segun: Yeah.

Stella: Yeah, it's reasonable that you'll explore these different segments that connect with your main research topic before getting your hands dirty, so to speak. So how do you describe your work to people, like, in your, your family? Do you have others, like scientists in your family? Or engineers?

Segun: Um, funny enough, I'm the only scientist in my family and, uh, (laughs), it's always very tough to describe what I'm doing to them. When you mention the robots, um, most people think, um, you're talking about, um, the humanoid or you're talking about a toy. So I just try to tell them, um, I'm working on a machine that can help, um, stroke patients, um, regain I- lost motor function. Make them better and get back to, um, activities of daily living. That's how I try to describe it to most people.

Stella: Yes that's a good way to simplify it. Can you give a visual of what this robot looks like, and how you use them for your research?

Segun: Okay. Um, it's a robot because it consists of, um, a mechanical structure and it's being controlled by, um, program code. So it's a platform where we have, um, stroke patients. We call them survivors though. Stroke survivors and subjects tend to hold, like, a joystick end and you

have the robot trying to move their hand to train them, you know? Um, patients who are recovering from stroke, um, cases...

Segun: In most cases, um, lose most of their motor functions. So they can not exert power to move their arms or their legs. Or this case, um, we have the, um, the rehabilitation robot aiding them through the specific task and if they do that repeatedly, uh, pretend to learn, um, the process of doing what you've been doing before. But in concept with, um, fortunal? electrical stimulation, their muscles are being stimulated at specific amplitudes and in my work I'm applying EEG to get the intention of the patients. So those who can not move their hands at all we have, um, their intention being moved from the motor cortex, and the robot is instructed to, to aid them.

Segun: It's more of training. It's more of training.

Stella: So you're using the EEG, electroencephalogram-

Segun: Yes.

Stella: ... Um, to look at their electrical activity. While they're trying to use this joystick to train the brain to do all these motor actions? Yeah, that's cool.

Segun: Exactly -

Stella: How did you choose a focus of stroke victims? Like, how did you... Because I know you wanted to do engineering and was it typically in the realm of neurology to do it, was it always going to be biomedical or did want to create, like, other kinds of devices?

Segun: Um, from the onset, I'd always want to m-... I'm always interested in the application of engineering in solving real life problems, um so it's more biomedical now.

Stella: Mm-hmm (affirmative).

Segun: Because I'm an embedded systems engineer so my domain for now is biomedical. It's, i-... For now, I concentrate on, um, patients who are affected with neurological disorders. Maybe Parkinsons, but for my master's project, it's for strokes. I'm merely trying to rehabilitate by using, um, electronic devices. That's, that's what I'm doing.

Stella: So what are some exciting things that people are looking towards, like, in your field. So beyond, like, what you're creating. Like, what're some other things that people are looking into that interest you?

Segun: Uh, basically, i would say, um, before now we've always had, um, researchers looking into this major issue in, um, robotic neural rehabilitation that's trying to compare um, robots to conventional physiotherapy. Trying to look at the superiority and, um, for most of this, um, there have been so many applications. So from engineering. But for now it's, e- because, um, robotic neural rehabilitation is still at the infant stage. Um, we only have a few robots that have reached the clinical stage for commercial purposes. Like the MIT minus. But for now mainly, uh, f-...

what's interesting generally is to see, um, how we can say that the, the, the outcome of robotic neural rehabilitation is compared to conventional physiotherapy. So many processes but that's always been the core topic tha-, that's been around for a long time.

Segun: Unfortunately, in Africa it's not just about, um, the superiority of, um, rehabilitation robots to conventional physiotherapy. We are clinging to another narrative and that narrative is that, um, we have less, um, man power here in Africa. So if we can have rehabilitation robots to augment the job of physiotherapists that would be something nice because, um, presently, Africa and subSaharan Africa has the highest incidence and mortality of, uh, stroke cases in the world. So it's about deploying robots to, to better the life of Africans for now. That's what we're looking at.

Stella: Yeah. That's interesting. So the lab that you're in, um, is the focus mostly in, I guess in robotics obviously but what are the other approaches that people are looking in your lab. Like, what's the main topic? Is it... Because my lab currently, we use bioinformatics techniques but then everybody just really studies different diseases, so I'm curious. Like, what kind of research everybody else is doing in your lab.

Segun: Okay. Um, my lab looks more into, um, bioinstrumentation and bio signal processing then control engineering. Um, we have some other groups looking into prosthetics. Um, some looking into autothics and, uh, presently we are looking about, um... I'm also working with some other group on signal processing from acoustic sounds from, from part of the body. It sounds so interesting that you can classify, um, different sounds from different parts of the body. That's, like, fun to me.

Segun: So we have some looking into... It's more of something BCI also brings in their computer interface. It's more of stroke, um, some other aspects, uh, then machine learning for classification of signals

Stella: wow, that's so interesting, my work is definitely on the other end of this, it's really fascinating to hear about what everyone in your lab is doing, thanks for sharing

### **Music Break**

### **Who is Segun?**

Stella: So you're in your second year now. How much time more do you have to complete your master's program and what do you plan to do after?

Segun: Technically, I'm left with about two months, if not for COVID-

Stella: (laughs)

Segun:... (laughs) I might have been done (laughs).

Stella: Congrats

Segun: If not for COVID.

Segun: Yeah. Um, after my master's degree, um, I will be going for a PhD in biomedical engineering. Um, I hope to continue in this, um, same line of rehabilitation. Uh, hopefully I post-grad, uh, would love to be in the R&D, um, looking forward to seeing how theories and experiments materialize to help patients get back to normal lives. and if I can get a space in, um, in the academia-

Stella: Yup.

Segun:... so be it.

Stella Yeah that would be good, Fingers crossed. So you've told me more about your research and plans to dive deeper into the space of engineering post-masters program. Tell me more about you, are you from Osun State?

Segun: I'm a Lagosian.

Stella: Oh, you're a Lagosian? (laughs). Oh? Where in Lagos are you from?

Segun: I'm, I was born and bred in, um, Badagry. Badagry is like, um, the ancient town where you have this, um, um, slave trade, um, history. Yeah. But originally, my state of origin states that I'm from Abeokuta in Ogun state but I've grown... All my life I've been in Lagos so I call myself a Lagosian.

Stella: Yeah, I mean, I grew up in Lagos but, um, I was in the mainland. Magodo area.

Stella: Yeah

Stella: But my mom still lives in Magodo

Segun: We have a house in Gbagada s- so-

Stella: Oh, Gbagada. I went to Corona Gbagada for primary school (laughs).

Segun: Oh, that's good. I know your school (laughs).

Stella: You know my school, I know. That uniform is terrible (laughs).

Segun: (laughs).

Stella: Yeah.

Segun: I only did my primary and secondary education in Badagry then I moved to Gbagada because we had a house in Gbagada.

Stella: Oh? Cool. Cool. Yeah, I did secondary, um, school in... Do you know Supreme Education Foundation, SEF or Atlantic Hall?

Segun: Yes. I've heard of that

Stella: So I did supreme first from, like, JS one to JS three. So junior secondary one to junior secondary three for the Americans non-Nigerians listening. Um, I guess that's like equivalent of seventh through ninth grade and then once I started SS1 or senior secondary school, I went to Atlantic Hall, um, and then I did most of SS1 then I moved to the states

Segun: So it's just like we are Lagos. You're were talking about Lagos. We are in Lagos virtually now (laughs).

Stella: Basically we're in Lagos. Yeah (laughs). I just miss, miss all the, you know, akara that I could buy on the streets. Uh, my aunt is sending me a bunch of like ofada and efo riro recipes so I'll be trying that.

Segun: That's interesting. That's interesting.

Stella: Um, so you mentioned that you're doing your master's right now and so before you were, you were in the polytechnic and then you changed to, uh, I guess, four-year program-

Segun: University.

Stella: University?

Segun: Yeah.

Stella: Um, and now a master's and then a PhD. Um, some might th- say that's a lot of school but as Nigerian that's not enough school. Um (laughs).

Segun: Yeah. You're right.

Stella: How (laughs), I mean how do you feel falling into the trap of being an engineer, you know? There's four options. There's doctor, lawyer, engineer and disgrace. Um, so I'm proud of us (laughs), both of us, um, but my main question before I sidetracked was, is... What's the structure for grad school there? Do you have to do a master's first before a PhD? Because I mean, here in the states you don't have to do a master's first before a PhD but I know like, places in Europe expect you to do that before.

Segun: Yeah. In Nigeria, basically, um, to the best of my knowledge, and I can speak for the applied sciences. Generally also you must have, um, a master's degree, before you have, um, a PhD. A master's is, I think minimum of, um, about 18 months, one and a half year then to years

then PhD. So the structure here, you can't go straight to PhD. As far as I know, you must have a master's just like Europe t-. So the structure is technically the same. Some parts of Europe so you have a master's before a PhD.

Stella: What's the application process for, like, the master's degree?

Segun: Um, for the applied sciences, also where I belong, that's where I can speak much about.

Segun: Um, you should have a minimum of, um, second class lower. That's about, um... Some say 50% of your CDP. That's 50% average. Some 60%.

Stella: What's CDP?

Segun: Cumulative Grade Average.

Stella: Oh, okay.

Segun: 50% or 60%0-

Stella: Mm-hmm (affirmative).

Segun:... Because we are on a scale of five here in Nigeria so you should have a minimum of 3.0.

Stella: Okay.

Segun: Yeah. That's, that's the requirement and, I don't know... The committee on it when you apply-

Stella: Mm-hmm (affirmative).

Segun:... I don't know what they look for. I've never been on that committee before (laughs).

Stella: Yeah. I mean, you, you might be. You could be in once you're done, um, in an academia.

Segun: Yeah.

Stella: Are you planning to stay in the same school for a PhD or are you looking elsewhere?

Segun: Um, I'm not planning to stay back. Um, I want to have better education, have more exposure (laughs). Definitely the US, you know, Canada or... Definitely, I'm, I'm planning to leave.

Stella: Mm-hmm (affirmative).

Segun: Because I've, there's no bioengineering PhD in Nigeria. Not even master's. If I'm not wrong. Just some few, few ones just growing up. I'll definitely want to leave.

Stella:... You started applying elsewhere?

Segun: Yeah. I've started my application processes (laughs).

Stella: Good luck (laughs).

Segun: Thanks so much

Stella: Uh, yeah. Especially like in these Corona times, I don't really know how things are changing, especially for schools. Um, I mean-

Stella: I've, I've been working from home since March and up until to January so, um, yeah (laughs). So what-

Segun:I, I can imagine.

Stella: I mean it's, it's, it's... It's not bad. I mean, I'm grateful that I still have the opportunity to still work and be in school and survive for now. Um-

Segun: Yeah.

Stella: Yeah. So what would you say is your favorite part of what you do?

Segun: Um, I would say I love solving problems and, um , when I start a task, it looks very impossible. Each I move a step higher, um, solving problems I'm always very happy. Um, for what I'm doing presently, uh, I derive joy when I walk across the hospital hall and I keep telling myself that very soon we'll have indigenous rehabilitation to help these stroke patients. It gives me a lot of joy and, um, you know? When I started, it took me about one year to convince everyone around me except my supervisors that this project is feasible, uh, but you know, with hard and, um, support from everyone, my PI applied for a grant and based on my research work we won a big grant and boom. We became celebrities (laughs). So everyone is interested in what we are doing.

Stella: Wow. Wow.

Segun: Yeah.

Stella: An honor to be talking to you (laughs).

Segun: (laughs). Thanks so much. So, the greatest of all is that, um, I'm seeing progress. I'm seeing meaningful progress.

Stella: Mm-hmm (affirmative). So-

Stella: Yeah. So going off on that, what's your least favorite part of the graduate school experience right now, of the master's program so far?



Segun:Wow. It's been very challenging because, um, I have three supervisors, um, s- yes. I have my main supervisor in electronics, the other one in physiotherapy, the other one a professor in neurology so, uh, switching between the three fields is very, very tough because I have domain knowledge, um, basically in engineering. So going for rotations, learning the basics for about a year was very tough. It was not fun. I was...but it's a bittersweet experience. I... Now I have more interest in neuroscience. I got exposure to some comp neu. It's good but Like I said, trying to convince everyone around me for a year that this is possible. That we can get something out of nothing in Nigeria and Africa and it was tough

Stella: Yeah. Did you have, like, a backup project or like, why did they not... I mean they... Obviously, the people have to believe (laughs) and I should put in the work for things to work but like wow. Yeah. I'm glad that it got funded though. W- what else would you have done if you weren't working on this project?

Segun: Yeah.I will have been in the field of biomedical also.

Stella: Mm-hmm (affirmative).

Segun: Probably not stroke. Because my undergrad final year project I designed a three, um, um, a 3D prosthesis for amputees.

Stella: Mm-hmm (affirmative).

Segun: So since my undergrad I've had interests in biomedical engineering.

Stella: Mm-hmm (affirmative). I think that's interesting that you even have three supervisors because I mean, here I have, I, I'm part of a lab and so that is my, I guess my supervisor, my advisor, my mentor. Um, so you're in a lab wouldn't that be your main supervisor? Are these three people maybe your, thesis committee? do you meet with them weekly? How does

Segun: Yes. Yes. I have, I have my main supervisor in my lab. That's my PI. Then I have co-supervisors because, um, my research is more multi disciplinary so I have... For the thesis, yes but I still go to their clinics. Like, I got to the hospital. Go for ward rounds. I, yes. I forgot to tell you that I go for ward rounds also, with the doctor so (laughs) it's, it's, it's something, I don't know. Interesting I must say

Stella: Yeah. (laughs). You sound like you're very busy. Do you... Like, so (laughs).

Segun : Yeah very busy.

Stella: So, so do you work... How... So what does your, your work schedule... Do you work nine to five? Do you work weird hours (laughs)? Do you work when you can? Um, because you have three bosses, essentially.

Segun: (laughs) I only stop working when I can't work again. You know? (laughs). My lab is a teaching hospital so m-, my daily schedule is to go to the lab, um, I have delivera- deliverables for the day when there are no meetings.

Stella: Mm-hmm (affirmative).

Segun: Then when I was going for classes, then I go for clinics. On Fridays I go for rotations, but it's more of hardware, software and medicine. So it's, it's... I don't know. There is no specific schedule for my work.

Stella: Yeah. That makes sense.

Segun: Yeah.

Stella: So since COVID, have you been working? What has changed for you?

Segun: Wow. Since COVID, um, I have been working, working more on my PC and my laptop because at times I need to go to the workshop. I could not go to the workshop, uh, then I go to, work more on the manuscript. I'm having more experience in writing of papers now with my supervisors so it's more of paperworks now and I'm not happy as an engineer. I'm used to getting my hands dirty (laughs).

Segun: That's how it is. But I have more time to do a lot of things than a lot of online courses. I'm on some summer schools virtually so it's school. I have more time to, to develop myself.

Stella: Yeah you've got to do what you can

Stella: So outside of your work, what do you like to do for fun?

Segun: Um, I love playing football. I'm a typical Nigerian (laughs). Um, then I love nature watching. I watch um, some animals. I have binoculars to see squirrels and birds around my quarters here.

Stella: So you're looking at squirrels and what else? Lizards? I always got terrified of seeing so many lizards outside the house. Geckos everywhere (laughs).

Segun: a lot of animals here. Then I'm, I'm... Apparently I found passion in some gardening works now. I think I'm paying my attention to plants. Hopefully I can get some inspirations from them.

Stella: That's awesome! Are you planting anything that you're eating, or?

Segun :Yes. I planted vegetables since March and I have been eating the vegetables. Spinach. I've planted spinach, um, tomatoes and I have been, I've been feeding on that for a while.

Stella :Wow. That's awesome. I have (laughs). I mean, I just also started gardening. Um, I have some mint. Um, basil-

Segun :Oh?

Stella : And then some non-edible like, succulents. Um, but when I was actually living in Nigeria my mom, w- we planted a mango tree (laughs) in our house, like, the middle. And then I'd moved to the states by that point and since it takes like three years, you know, to bear fruit, she's like calling me like, "Oh, I'm eating mango. It's so good" (laughs). Its like very big-

Segun:That's interesting.

Stella ... And I'm like, "That's very, that's very mean. That's not motherly." I'm just kidding. Um, So, besides football, gardening, and nature watching, what else do you like to do outside of research?

Segun: Yeah. I love traveling a lot. Like, I love traveling

Stella:Where have you, where have you gone that you, you would recommend?

Segun: I'm with... Um, India. I recommend India. India subcontinent. Uh, it's not a country. Uh, I recommend India. I've been to Qatar also but I really enjoyed India. That's, that's what I'd say and I toured West Africa. Um, Benin, Togo, Ghana, Ivory Coast. I recommend India and Ivory Coast for anyone who wants to travel. Within West Africa, Ivory Coast?

Stella: Mm-hmm (affirmative).

Segun: Asia, India?

Stella: That's awesome! Thanks for the suggestions. I'll keep them in mind for post-covid adventures.

## **Music Break**

### **Science, Identity, and Challenges**

Stella: Switching gears here a little, I wanna to open the discussion to talk about the intersection between identity and science, research, and academia, you had mentioned that you were interested in discussing how your identity influences your research experience. So, my question for you is, as an underrepresented scientist, how has your identity shaped your type of work, how you think about science, and professional career trajectory?

Segun: Wow. Uh-

Segun: These are sensitive, um, questions. I remember working w- when I did my internship in India 20... 2015 and um, I was leading a couple of, um, Indian students. I was heading their team. Putting them through basic electronics and... I'm getting a bit emotional, and I, and I get these comments like, "Oh, come on. Y- you're not Nigerian. Come on. You can not be African."

Segun : For what I'm doing. It's, like, never expected, um... I don't know. Um, technical expertise or brilliance from... In science from an African or from a Nigerian and I feel so embarrassed when they tell me no that i'm not Nigerian. I'm an Am-, I'm an American or what... Shit like that. Let me leave that.

Segun: So back to the sciences.Um although have no issue because of you know? Everyone here looks at me like I'm Nigerian. Um, but what I observe in the global spaces. For recessions back here in Africa and Nigeria, I will talk for my lab and for my space now. Um, for us to have global recognition, um, in most cases we need to collaborate with, um, m- other partners from other parts of developed countries. Although science is about collaboration and partnership, like we say, it's a global community but you residing here in Africa, you need, um, collaboration outside to have, um, some people listen to you.

Stella: Mm-hmm (affirmative).

Segun: Even sending with some email address...They might not even respond to you so those are one of those, um, challenges we face here.

Stella: Yeah.

Segun: but not even helping to be Nigerian but, um, we are very hard working and, uh, great people. We have this fighting spirit to do whatever I want to do and do it well. So in most cases I don't look at those, um, challenges. They propell to, to do much better.

Stella: Thanks so much for sharing that. I definitely experience that too. I mean. Most places you go to they're like, "Oh wow. You're so smart and articulate for your..."

Segun:Yeah.

Stella: For being black? (laughs). You know? And-

Segun: Yes

Stella: I think also like the fact that would d- mention like you're African. Like I would always ask them back like, rhetorically, like, "Oh wait. I, I'm African? Really? I'm Nigerian? So why can't I be Nigerian?" Um, (laughs). I mean, I think Nig-... Nigerians are very educated. Most times you meet people like, everywhere. Like in the States, especially.

Segun: Yeah.

Stella: I hate the fact that you have to collaborate with some other person outside of Nigeria just to get recognition.

Segun: Yes.

Stella: I think that definitely has to change and I don't even know how that is going to change. How do you..? Maybe that's your... That's w- what you're going to do as an academic. You're going to change that.

Segun: Yeah.

Segun: Yeah. Uh, uh, uh, particularly for me, I'm so, um, interested in, um, indigenous technology and we must, we must, um... How will I put it? We should, we should, create our technology for what we need. I- in most cases, um, we do not domesticate our designs and technology. That's what I fight for most times. We should provide solutions to our problems. With external influence and support good but we must try to...I tell people you make designs-

Stella: In, in house. Yeah.

Segun: You know?" Try to make it, um, domestic to solve your problem because no matter how you try to say you are good you still remain an African. Even your skin shows that you are an African so I can not deny myself being an African.

Stella: Exactly. We have to solve our own problems

Segun: Exactly. We should look inwards

Stella: If we use our own resources it's much better for our own environment and our own well being because it's like, we're not always looking to the west to be like, "Oh, that's the..." You know, "That's the blueprint." That's not the blueprint

Segun: That's what I fight for too...

Stella: Yeah.

Segun: We must be original, you know? It's one of our major problems. I don't know. I don't know.

Stella: that definitely needs to change and I think this year is making a lot of people really introspect and I hope something really does change. I really do.

Segun:I hope so too hope so too

Stella: Because I mean, you're doing really exciting research and, I mean, the community needs to know more about, like, everything that's going on because we can't just all be working in the silo (laughs). And if-

Segun: Yeah.

Stella: You know they could be working on something in Austria and they don't know that, you know, Segun has created something amazing, all the way in Ile Ife. Um-

Segun: Yeah.

Stella: And they don't know. I mean... So I think one thing it's... It is great that there's all these conferences that you're going to and you're presenting and

Segun: Yeah.

Stella: Getting that information out there that we can do it.

Segun: Yeah.

Stella: We're as good. (laughs). You know?

Segun: Yeah. Exactly.

Stella: Um, Yeah.

Segun: Exactly.

Segun: A lot of collaborations, We got a lot during this COVID. A lot of sponsorship and

Stella: Mm-hmm (affirmative).

Segun: From open BCI, And I was basically applying for anything I could just find. I was just applying for everything.

Segun: :While I was having the chat with my supervisor before I picked the project. Um, he told me, "Yes. Segun." I know you I have worked with him." And he said. "Segun. This is what I'm looking at. Although you might not have enough resources, let's try to get something out of nothing." So putting the first prototype up was hell. You know? It was hell. I know there are no fundings for grad school, you know? Even education is underfunded, less, less grad school. So it's, it's, it was hell. There were no sponsors until... Don't let me even go to the... I don't want to talk about the government part (laughs). So

Stella: Yeah, let's not talk about the government.

Segun: But what I try to tell everyone is that (laughs). Yeah. I, I just... No, I can talk but it makes me so sad and I don't want to spoil my mood.

Stella: No, it does make me so sad, you know? Yes, we're the leaders in corruption but like w... Can we not (laughs)...

Segun: (laughs).

Stella:... Can we stop stealing money and give it to people?

Segun: Exactly

Stella:I was curious about how your funding came because you just said you applied for funding, where do you get your funds from? Was it like, pharmaceutical companies like, what did you apply to?

Segun ):At the onset for my research work, um, it might interest you to know that my three supervisors, including myself, funded research. We have funded research. Um, from their personal purse that's how we were able to pick up the project, then applied for the, um, tech funds tertiona- tertiary education trust fund. It's for universities, so I applied for that after a series of defense bla, bla, bla and we got it.

Stella: Is that all from Nigeria that tertiary

Segun: Yes, yes. Uh, from the federal government, yeah. It's from Nigeria. Um, they have this going for tersh- for tertiary institutions, uh, for buildings and some for research. So, uh, we're on the second version of the prototype that I did. Uh, the robot I designed was called Pulsar platform for upper limb stroke rehabilitation. So we did Pulsar one for masters work so we are on Pulsar 2. Hopefully Pulsar three, four... Who knows? We'll get it somewhere. So basically from scratch was how we put up things and, um, here we are. We got the grant, we got some other sponsorship. Things are getting rosy having collaborations now with some other labs across the world. It's good. It's good.

Stella: I think it's insane they had to pay out of pocket for their... I mean, I mean you have to really sacrifice a lot if you believe in something.

Segun: Yeah.

Stella: How is compensation for grad students? Because I know you applied for funding but that, does that cover, like research and like, living and food? How do you sustain yourself as a grad student and not working? Or do you have second job?

Stella: Yeah. That's good. I think it's insane they had to pay out of pocket for their... I mean, I mean you have to really sacrifice a lot if you believe in something. So they believe you enough to take their own money (laughs). Um-

Segun: Yeah.

Stella: How is compensation for grad students? Because I know you applied for funding but that, does that cover, like research and like, living and food? How do you sustain yourself as a grad student and not working? Or do you have a second job?

Segun: Yes. If you don't have a second probably you are dependent on your family (laughs). Um, for me I had saved, um, a couple of some money before I came back and I was working. I was like working when I was still an undergrad. Engineers and programmers always find a way to get some jobs, but for the grant it covers some stipends for my lab. I'm only speaking for my lab. But getting grants or sponsorship or grants or sponsorship for grad school is very very slim here in Nigeria: Yeah. So grad students are not paid except you are able to get a grant on your own like, I got a personal grant. E-, no. Not one. Like two, three grants (laughs). Personally, probably apply for some grants. Um, travel grants. Probably cuz you're publishing the paper, you're presenting the paper or doing something But grad students are not paid now. There are no stipends like that.

Segun: Not like the US. It's like you go to secondary school. You pay your school fees. You go for your BS you pay your school fees. You go for MS you pay your school fees. Except you get some RA research assistant. I'm a research assistant to my supervisors because he has a standard of structure of what's an ideal grad school or research lab. How many labs do we even have in Nigeria

Stella :Yeah. I, I want to know. Because I want to know what kind of... How research is there. Uh, (laughs), um, because I know some people that are, you know a lot medical doctors from Nigeria that have been trained there, you know?

Segun: There are not much established laboratories. Like labs. Like PI. Tell some people PI there, they don't know what a PI is.

Stella: (laughs). They're like, "Are you investigating me?" (laughs).

Segun: (laughs) But, but, my, my supervisor happened to... I think it's about exposure. He happens to... He's like... So to say, not because he's my supervisor and that's why I can always stay back because, um, I was to come to the States master's 2016. That's another last story. He was the only person I could stay back with to work with for my master's.else I wouldn't do my mastersMy master's because he has an organized structure for a lab.and he's like having collaborations with, um... What I'm telling you, what I'm doing is, um, is weird. It's weird in Nigeria, I must tell you. This structure is weird a engineer

Stella: It is. Yeah.

Segun: Going for ward rounds in the hospital. That's why I told you it took me a year to convince them. Th- They'll tell you, "What are you doing? Do you know what you're doing? Uh, what's (laughs)"?

Stella: Mm-hmm (affirmative). I mean you're making a difference so, I mean I'm sure they'll see that this is working because you can't just do one thing in one area and not know how it works in practice.



## **Music**

## **Wrap-up**

Stella: This has been a very exciting interview, we've not only learned about you and your research, but we have also gotten a glimpse into research on your side of the world. The intricacies, the challenges, and yet the worthwhile discoveries. Thanks so much for talking to us today, I wish you the best of luck on the rest of your endeavors

Segun Yeah, Um, thanks so much for having me on CTR radio. I'm so pleased and honored to be interviewed. Um, kudos to you guys and, um, thank you very much. Ose (Thank You) from Nigeria.

## **Music**

## **Credits**

Stella: This episode was produced by me, Stella Belonwu, with help from the Carry the One Radio team. I'd like to thank Segun for taking the time to speak with me across many time zones. This episode wouldn't have been possible without the enormously generous support of our Patreon supporters. So, I'd like to thank this episode's science producers, Sama Ahmed, Carly Van Orsdel, Jeannine Cuevas, Samantha Ancona Esselmann, and David Cabral, for supporting us financially through our Patreon.

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Thank you for listening! And as always, Stay curious!!