00;00;03;28 - 00;00;19;21

Tia

Hello everyone, my name is Tia and welcome back to another episode of Microbe Talk. Last month was Women's History Month and we caught up with a very special guest. Leading an inspirational career in science, let's introduce Doctor Linda Oyama.

00;00;19;23 - 00;00;31;13

Linda

Hi Tia, thank you for having me on the podcast. I am Linda Oyama and I am a lecturer at Queen's University Belfast in the area of Microbiology and Antimicrobial Resistance.

00;00;31;14 - 00;00;35;14

Tia

What led you to that current career path focusing on AMR?

00;00;35;15 - 00;00;58;18

Linda

It's a very interesting question. Thank you, Tia. So I have been very interested in like solving medical problems right from when I was little. I was always fascinated by the fact that our lives are in the hands of other people when it comes to sickness, but what made me really want to understand microbiology a little bit more in relation to genetics was when I had a younger brother.

00;00;58;18 - 00;01;22;15

Linda

Unfortunately, we lost him many years ago, but he would have had a medical condition which was genetic. But the, the medical practitioners didn't really know what it was at the time and we lost him just before he turned six. At the time, I was already in university and studying microbiology, and that really made me want to understand, genes, and things like that.

00;01;22;15 - 00;01;50;16

Linda

And some one of the things that happened to him was that the medicines they gave him didn't work. So I wanted to understand anti-microbial resistance, why medicines will, be ineffective and why bacteria? you know, lots of microorganisms become resistant to medicines. So, I decided to choose a project, in antimicrobial chemotherapy to understand using alternatives to antibiotics to see if they would work at a time.

00;01;50;16 - 00;02;04;03

Linda

I use some plants, extracts. And then I decided to further my education, and I came and did a research masters where I also looked at alternatives to antimicrobial. So that has led me to where I am now.

00;02;04;06 - 00;02;26;02

Tia

That was very impactful and insightful. It was an interesting back story as well, to understand what led you to that career path and that journey. So I appreciate you sharing that. And I know you also mentioned that you've worked on a few different projects. I would like to know what was the impact of that project, and can you tell me a little bit more about ones that you have worked on and ones that are in the works, and an upcoming?

00;02;26;04 - 00;02;54;08

Linda

That's going to be a lot of projects. Okay. Let me start with my, say, the, a project that I did during my PhD. so in that project I was prospecting. so know the words I could say I was mining for new antibiotics. So alternatives to antibiotics in a, a new, sort of environment, which was the got all cows.

00;02;54;11 - 00;03;15;04

Linda

Okay. Because we thought there's so many organisms in the gut of cows, there are bound to be some that are fighting against each other. And they have like a chemical warfare of who is going to survive or not survive during digestion. So we thought that this would be a good place to look for, new compounds and chemicals that are being produced by micro organisms.

00;03;15;07 - 00;03;50;09

Linda

So in that project, I was able to use very basic microbiology methods, but also at a time, genomic sequencing was becoming very it was becoming a thing and it was becoming popular. And you'd be surprised I use the Roche 4 or 5 for that sort of outfit now. But, that was really interesting for me because I was able to look at the sequences of bacteria, genomes, and to understand what among those sequences might be a potential antimicrobial in terms of the proteins.

00;03;50;11 - 00;04;24;09

Linda

And I identified from that over, 180 new proteins that we could use to treat infections that are resistant to current drugs. And so far, I have published maybe six papers regarding some of those, antimicrobial peptides, as we call them. So they are very short and proteins, of about 8 to 20 amino acids. And they have a lot of activity, sometimes very specific, sometimes broad activity to gram positive.

00;04;24;09 - 00;04;50;25

Linda

So, some people may have heard of Staphylococcus aureus, popularly known as staph. causes a lot of infections, in hospitals in the community, and sometimes very difficult to treat. Some people would have heard of E.coli or Escherichia coli, as we call it, and that would cause a lot of urinary tract infections in humans and a lot of, sickness in your belly as well.

00;04;50;27 - 00;05;14;20

Linda

and salmonella. So my compounds we were using to test for some of these, some of these, again, some of these bacteria, and we also kind of tested them against bacteria that would be implicated in disease for animals as well. So, so things like mastitis in cows and for treating things like histamine as a blackhead disease in Turkey.

00;05;14;23 - 00;05;36;07

Linda

So it's had a lot of impact in a sense. Like a lot of them are now and currently being, developed for commercialization with some of our industry partners. and we're currently undergoing some, some

more in-vivo trials in mice to understand how they work in some of these conditions. So it's very exciting.

00;05;36;09 - 00;05;43;00

Tia

That those are really exciting. I love how excited you are about it. Can I ask so is that an ongoing project then?

00;05;43;00 - 00;06;07;09

Linda

Yes. So this has that project has carried on. So it's ongoing. and we've we've been collaborating with lots of, scientists across, across the, across the globe. and what we're doing currently, we want to try and, optimize some of these peptides for treatment of mastitis in cows, which is a huge problem for the dairy industry.

00;06;07;12 - 00;06;40;06

Linda

and mastitis is caused by a range of bacteria and fungi. and so what we're doing at the minute is trying to optimize the dosage, of our compounds in, in first of all, in the mice model of, of mastitis. And then we'll upscale that once we know all the dosing parameters and the efficacy against, either a single mastitis crossing strain or, called co-infection where there's more than one strain.

00;06;40;08 - 00;06;56;26

Linda

So we want to see how they work in that scenario before we can move on to, a full blown cow, experiment, because those are slightly more expensive. So it's better to get your basics right before you go into them to, to be sure that you get the right results. So that's ongoing.

00;06;57;01 - 00;07;05;24

Tia

That was lovely. Thank you for sharing that. I think based off of that correct project, what would you say has been the most valuable learning point from this experience so far?

00;07;06;01 - 00;07;43;18

Linda

I think that something that I found really fascinating and I've enjoyed actually, when I've been working with this projects, is talking to industry partners and talking to, patent lawyers and just kind of seeing that communication of, who has data and who has ownership and how you navigate that kind of if you decided to license the product to industry, what are the processes for doing that or even just pitching it correctly to the right industrial partner that might be interested in your product?

00;07;43;18 - 00;08;05;03

Linda

For instance, so I've had a lot of meetings with technology, transfer offices and advisors and just, just that learning has been very useful for me. I found it like a different world. I thought, this is this is really amazing that I'm talking to all these different people. So I think for me, that part is something that I wouldn't have done on my own.

00;08;05;06 - 00;08;21;21

Linda

and the other aspect that I find really fascinating is the pharmacology aspect, because in order to, bring a drug forward for use in anything, you have to understand how that medicine goes through the body and the different organs and how it's distributed and so on.

00;08;21;23 - 00;08;42;21

Tia

And I love how you actually shared that aspect of interacting with people and that being something that's exciting for you, learning more from different people. Because I was actually watching a past interview with you from annual conference where you share that your passion actually lies in interacting with people, and that's some of the best ways to achieve solution for scientific problems would be as a team.

00;08;42;23 - 00;08;45;00

Tia

Can you tell me a bit more about why this is your perspective?

00;08;45;06 - 00;09;09;24

Linda

I suppose you always learn from other people. I wasn't meeting just yesterday with some of my, present collaborators from Canada, but they also brought on potentially new collaborators who could sort of help with some of my research questions, which I don't have the, you know, capacity to do. you can't do everything by yourself. So I'm a microbiologist.

00;09;09;24 - 00;09;33;23

Linda

I have a broad range of skills, ranging from basic microbiology, protein science, you know, molecular biology. I have a little bit of peptide science knowledge, but even with all of that, there are aspects that you're very good at because you've spent a lot of time studying it. And there are other aspects that although you have broader understanding and you have done some things in it, you are not an expert in it.

00;09;33;26 - 00;10;02;19

Linda

So you do need expertise, in these areas because they will bring a fresh perspective. I remember writing when I wrote my first big publication. It had, I think, 22 or 23 authors, including myself. And these authors came from about 11 countries, and they were all coming from different backgrounds. So some of them were peptide chemist and some of them were biophysicist and some were mathematicians and some were modulus.

00;10;02;21 - 00;10;28;10

Linda

And even though I had written the paper, I had sent it to every one of them to have a look at and the different perspectives that came back and the feedback that I got from different people. I thought, wow. And that's a very fresh perspective that this person has given me, and that's a good learning. So I have learned from talking to lots of people and in fact, I always say this about the Microbiology Society conferences, that they are a wonderful place to talk to people.

00;10;28;13 - 00;10;53;16

Linda

I remember when I started my PhD, I would deliberately go to the Microbiology Society conferences because there were people that I had earmarked today, and I would I would practically seek them out to, to speak to them. And that was how I formed some of the collaborations that has helped me in my in my career. At the time, we still used to have the, spring conferences that I met somebody I had said, I'm going to talk to that person.

00;10;53;18 - 00;11;10;18

Linda

and I went to them because at the time, even though I was doing this wonderful work, I wasn't quite sure what I was doing in the right way. And I wanted another person's opinion, apart from my supervisors. so I went and spoke to this professor and they and they said, oh, yeah, I sent me an email.

00;11;10;18 - 00;11;35;12

Linda

It sounds very interesting. I think you're on the right path, but send me an email. So I sent them an email. and, and they were very friendly and they replied. And that has, you know, blossomed into a very useful, collaboration, not just for the expertise, but they had equipment that we could use, at a fraction of the cost that it would have been to have done that experiment commercially.

00;11;35;12 - 00;11;41;22

Linda

So I think it's amazing. Talk to people. You know, the worst thing that can happen is there's no bill and you find somebody else to talk to.

00;11;41;25 - 00;11;57;15

Tia

Oh, I love that. I feel like that's a perfect quote right there. And I love how collaboration definitely plays a big part in your work. Do you believe that the current gender gap that exists in Stem has potentially limited any ability to collaborate with other women scientists?

00;11;57;15 - 00;12;35;26

Linda

Maybe there are more women scientists now than they used to be. However, I believe that the higher up you go in academia or in research, the fewer women you encounter. and that's especially true even for, say, women like myself who come from say, not so represented of, of, of a background. And so I think identifying women, who are in your field is priority if you're a woman and not just identifying them, but identifying the ones who are natural cheerleaders for other women.

00;12;35;29 - 00;13;05;08

Linda

Because, as we know, sometimes, just because somebody else is of the same gender as you, it doesn't mean that they're going to support your progress, or that they're going to be as supportive as a man. Sometimes even, but something that I found that was very useful for me when I was doing my PhD, I went to a Gordon Research conference, and they had a session on women, on a session where women just sat together and talked about their challenges and the way that session was run.

00;13;05;15 - 00;13;33;01

Linda

They had very senior women scientists with PhD students and researchers. And I think that those kind of meetings are very powerful because some of the things that were said there would not normally be said outside of those kind of circles. And in fact, that allowed me to identify some really good female scientists in my field. And even if I couldn't do any work directly with them, they have been very instrumental in pointing me to places.

00;13;33;01 - 00;14;07;19

Linda

So if I needed a collaborator on something, you would say, oh, speak to X, Y, Z from Toronto University or from so, so company. And I think that having those contacts has been good because it meant that there was somebody for me to call on and within the society as well. There has there have been few women that are just cheerleaders, even though you didn't work in the same institutions with them, but whenever you went to them or whenever you were in a meeting with them, you can tell when somebody is genuinely interested in the progress of others and I think that those are the kind of people we should seek out and keep

00;14;07;19 - 00;14;15;28

Linda

them close to heart. So we really need like a, a mentorship program. and for women to really have opportunities to collaborate.

00;14;16;05 - 00;14;23;25

Tia

I really enjoyed that perspective for Women's History Month. this year, do you have any plans? Would you be celebrating in any way.

00;14;24;00 - 00;14;56;17

Linda

Normally do something this year? having an event? There's a Stem event is happening in at my school, at the university. and I have been asked to come and give a talk about my perspective and my experiences as a Stem ambassador. So I'm going to be doing that. It's only about 15 minutes of a talk, but as always, I always say that, there's no point in giving a talk if there's no practical or engaging aspect to the talk.

00;14;56;20 - 00;15;15;13

Linda

So, I think that they're going to be in for a shock in the 15 minutes because I'm going to make them all do some microbiology in that time. but it will also be a moment where they're all going, because I will have lots of lovely photos with permission of, all of the places that I have been.

00;15;15;15 - 00;15;41;05

Linda

I really like passionate about the girl child. and education, especially when I've got three girls of my own. So. And I want to get my girls to be as sciencey as they can be. And so I tend to visit a lot of, in Northern Ireland. You'll be surprised. We do have a lot of single-sex schools, you know, just all girls, all boys.

00;15;41;08 - 00;16;03;03

Linda

So I tend to kind of target those old girls schools and go to them, and present science to them. So I'm going to be sharing some of that experience, with, with people. there's also an initiative that I

was running with them that is called, Ask a Girl in Science. I don't think we're going to do our best to try and launch something as part of this celebration.

00;16;03;05 - 00;16;18;16

Linda

we have a lot that that initiative has questions that young people have ask and answers from other STEM female STEM ambassadors and so it would be a good resource, for people who are interested in science, especially. Yes.

00;16;18;18 - 00;16;43;15

Tia

I think that's some really important and impactful work, especially showcasing and sharing that during this month in particular, I think those young ladies are going to be able to get something extremely valuable. I wish I would be able to attend that 15 session and be able to get, oh that's lovely, thank you and get what everyone else would be getting, because I feel like it would be a breeze of a session, like exciting.

00;16;43;17 - 00;16;49;05

Linda

And I don't want any spoilers. I could have told you what you might be getting, but no spoilers.

00;16;49;07 - 00;16;52;29

Tia

If you do share a bit of a spoiler, your podcast isn't going to come out till the end of the month.

00;16;52;29 - 00;17;02;16

Linda

Well, people will be getting DNA pendant necklaces from us, their own DNA. so it will be an exciting session. So I think it will be nice.

00;17;02;23 - 00;17;21;10

Tia

I love that, that that is so meaningful, something that they can take away and take with them, that is of them, and also our sacrum. So that is really beautiful based off of what you've shared, having three daughters yourself, wanting to continue to impact young women, haven't invested so much in your career and then reinvesting back into the community.

00;17;21;13 - 00;17;28;05

Tia

How important do you believe it is for women seeking a career in STEM, To see diverse representations such as yourself?

00;17;28;08 - 00;18;02;10

Linda

Diverse representation, I believe, is super important. and it's not just for women for anything really. especially for women. Imagine if I, I went to university and all the people who have done amazing things say discovery of science, and all I've ever had is from of somebody who looks nothing like me. it begins to give you the idea that perhaps only people of a certain group can do great things and can make breakthroughs, or things like that.

00;18;02;12 - 00;18;26;18

Linda

I remember applying for a fellowship application a few years ago, and, one of the things that came to mind when I was writing my application because they asked something about EDI, and research culture. And one of the things that came to mind, I suddenly thought, hold on a minute. How many people in my department actually like me?

00;18;26;20 - 00;18;44;05

Linda

At the time, there was no permanent staff in my department that looked like me. And that's not probably not a fault of theirs. It probably depends on who has been applying or what, what roles have been open in, but it almost became like a challenge to me. And I said, you know what, we need to break this.

00;18;44;07 - 00;19;12;17

Linda

And I think the reason why it really crossed my mind was I was given the opportunity to teach some lectures, when I was still a postdoc. and when I went into the lecture room in some of the lectures, I found one, just one, student who looked like myself. And I immediately felt almost sorry for the student because it made me think, hold on a second.

00;19;12;20 - 00;19;39;26

Linda

Every other person who teaches this student looks nothing like them. Especially there were there were there were female students as well. And then when I came to do the grading of the assessment, I felt even more sorry for the student because it felt to me like they were not engaging. And I kind of thought, is this a problem with identifying with who is teaching you, and therefore performing better, or is this just a problem of feeling left out?

00;19;39;28 - 00;20;02;07

Linda

And so I think it's very important to have representation of, of every of all the different kinds of people. Did something really need to think about, either as a society or as institutions? I think it's very important that students can see somebody who looks similar to them, or somebody who can inspire them, in one way or another.

00;20;02;10 - 00;20;26;25

Tia

Thank you so much for sharing that, Linda. I definitely agree with that sentiment. And, definitely appreciate and understand the fact that this is a place that you're standing in as well, being able to give that representation with your talks and impacts in with your projects as well. So thank you for also being a part of that change and that impact onto younger women.

00;20;26;28 - 00;20;34;19

Tia

And finally, Linda, what advice would you give to a younger self who's about to embark on the STEM career journey, given all that you know now?

00;20;34;22 - 00;20;59;00

Linda

My younger self, I was really shy, but I was very what is the word? Quietly confident. And what that meant was that I rarely spoke to anybody unless I needed help. So if I if I was in the classroom and the teacher went, do you understand? if I understood, I didn't put my I didn't say anything more.

00;20;59;00 - 00;21;28;21

Linda

I didn't contribute to what was going on. I always took everything as a challenge, and I would go away and try and solve it before coming back to the teacher. But I think if looking back now, and I think it would, the advice I would give to my younger self is maybe to participate more. I know that sometimes it can be difficult when you are, say, of an introvert, you're an introvert, or you're a little bit shy and people don't believe that I am.

00;21;28;27 - 00;21;48;26

Linda

I used to be or still am. I'm an introvert because you can't really change who you are. Because whenever I am in the room, I make a lot of noise and everybody knows that I'm there. but you'll quickly realize that I've made that noise and I've disappeared. but, I think it's important to just put yourself out there even, no matter how daunting it is.

00;21;48;26 - 00;22;12;12

Linda

It can be, sometimes to speak up. and I think that's the advice I would give myself, especially in the world that we are today, where you almost have to blow your own trumpet sometimes, no matter how good you are, you still have to be able to articulate how good you are, if that makes sense in the past, your deeds were enough or your work was enough for your certificate was enough.

00;22;12;15 - 00;22;32;28

Linda

But nowadays you have to make it known not just because you have to, but because there's so many good things happening and so if you don't shout it out on the mountain tops and you don't participate, then your contribution isn't heard. So I would say, young ladies, please don't be quiet, don't hide in the corner, participate more.

00;22;32;28 - 00;22;36;01

Linda

And no matter how daunting it is, say something.

00;22;36;03 - 00;23;02;01

Tia

I think that was really, really great advice and I feel like anyone at any age can take that advice on as well. And I love that. It's advice that shows in who you are today as well. Stepping out of your comfort zone as you shared, going up to people who you want to collaborate with, an Annual Conference, even having this interview today, the fact that you're going to present as well, I think that is really valuable advice, and we can see how you've taken it and how it's impacted your life in that positive way.

00;23;02;03 - 00;23;16;09

Tia

So thank you so much for sharing that. It's been a really it's been a really inspirational conversation and an absolute pleasure to learn these insights from this conversation today. And I just want to thank you so much for your time today.

00;23;16;11 - 00;23;20;28

Linda

Thank you so much for having me here. It was an absolute pleasure talking to you.

00;23;21;00 - 00;23;35;27

Tia

Thank you again to Doctor Linda, who shared her valuable insights on the complex world of Women in STEM, particularly science. If you'd like to keep up with Doctor Linda's work, you can find the details of how to follow her in the description box below.