**Inspiring Queensland STEMists podcast series**

**Professor George Mellick**

*Professor George Mellick is the Head of School, at the School of Environment and Science, Griffith University Nathan campus. Most notably, he is the lead in the Queensland Parkinson’s Project and a renowned clinical neuroscientist (seen on media such as ABC radio, TV news and current affair interviews, and TEDx sessions). Professor Mellick is a proud Queenslander who grew up in Mareeba on the Atherton tablelands in FNQ.*

*In this interview, Professor Mellick chats about the importance of STEM education for teachers and students. He explains how scientists need to work together at this critical time during the COVID 19 outbreak and in relation to his ground-breaking research at the Griffith Research Institute for Drug Discovery.*

Announcer:
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Welcome to the Queensland Department of Education podcast series about the importance of STEM. In this podcast, Dr Terri Burnet talks to Professor George Mellick about why a STEM education is so important in the 21st century.

Dr Terri Burnet:
Welcome Professor Mellick and thanks so much for joining us, particularly at this challenging time for all Australians.

Professor George Mellick:
Thank you very much Ms. Burnet. Then you can call me George.

Dr Terri Burnet:
And you can call me Terri. George, the importance of STEM education really has never been as evident as it is at this very moment, with scientists and researchers and mathematicians all over the world working together to develop test kits, vaccine, and a cure for COVID-19. Your research into Parkinson's disease also has a direct impact on people's lives. How important is STEM education for our children, in particular working across disciplines to look at issues like COVID-19 and Parkinson's disease broadly for solutions?

Professor George Mellick:
Well, Terri, it's extremely important and it's important for a number of reasons. The first reason is that a STEM education, so science, technology, engineering, mathematics, and you can even put the A in from steam in terms of arts, all come together to help someone understand the world. And particularly the science, the technology and the maths area help us to answer questions that are very relevant. And it's through this type of analysis that people are at the moment all banding together to look at an extremely important international problem, which is the problem around COVID-19. If you look and hear in the literature, in the media what's going on at the moment, you will see there is so much information. How do people type the information and work out which is right, which is wrong, how it affects me? All of these skills come from a STEM education and so it's absolutely critical. No one heard of COVID-19 until December in 2019, so it's an amazing thing to think into the future there are going to be new challenges that the world faces. We're going to need people in our community that actually can meet those challenges, so that's why STEM education is so important.

Dr Terri Burnet:
I'm glad you mentioned about the reliability and the validity of data because in particular in the Australian curriculum science, we address that particular issue at the moment. In the media there is a lot of... in some places, hype. We're getting conflicting stories and really people need to make their own decisions and analyse the data that they're getting in their lounge rooms, don't they?

Professor George Mellick:
That's right. The things that are really important is, what is that information that we're getting, how reliable is it, what is the source of the information? This is important across all of science. It's just as important in the work that my research does into looking at complex diseases like Parkinson's. One of the critical issues is that you need to be able to say, "Yes, I can trust that information. You know, it makes sense to me." I think that's one of the things that the STEM education can do, it helps you to ask the right questions.

Dr Terri Burnet:
So George, you've led groundbreaking research at the Griffith Research Institute for Drug Discovery at Nathan in Brisbane, and here you oversee research into quite a number of diseases, but most notably Parkinson's disease, which affects over 75,000 Australians. Can you just tell us a little bit about how the researchers at the Discovery Centre work together and some of the research that is going on into Parkinson's disease?

Professor George Mellick:
Yeah, sure Terri. I mean, Parkinson's is an important condition. It does affect probably more like 100,000 or more Australians. But see, that's an interesting point in itself because we don't know the exact figure. One of the things we do know is that the number of people in our community with Parkinson's is increasing because the general age of our population is increasing. These disorders, which we call neurodegenerative disorders, in other words aging disorders of the brain where a particular cell in the brain degenerate or die off for reasons we don't understand, and Parkinson's is the second most common one of these diseases, people will have heard of Alzheimer's disease, which is the most common neurodegenerative disorder. They're getting more prevalent in our population as people get older. And so the research that we do is to take an approach where we look at this disease from lots of different angles.

Professor George Mellick:
So one of the areas of research is to try to understand more about why those cells in the brain die. Quite interestingly to study that, sometimes we look at cells in a dish. In other words, we try to grow up human cells in a laboratory and we study the cell biology, what's going on in the cell and try to see what's wrong in the cells that come from people with Parkinson's. So that's sort of one area or big area of interest. Another area is an area that looks at the way that Parkinson's appears to be inherited in very rare situations in families. You do have this inheritance pattern in maybe two or three out of every 100 people with Parkinson's, they come from a family where there are multiple members who are affected. And so we then use different techniques to study the genes that might be involved in these rare circumstances and use that information to try to learn about what might be going wrong in the brains of all people that develop Parkinson's. So that's a different kind of area of research.

Professor George Mellick:
A third area, which is kind of related to what we've been talking about already in terms of epidemiology or the study of populations, we try to study where Parkinson's happens, where it exists and whether there are, if you like, clusters of it in certain parts of the population, what the risk factors might be and try to understand those things in a better way, so that's a third area. And fourth, which is very important also is, can we identify new treatments? One of the ways that we've tried to do that is to use nature to help us in terms of finding new potential drugs that might treat Parkinson's. So there all sorts of things that my team does in the research laboratories here at Griffith.

Dr Terri Burnet:
So George, we've got cell biologists, pathologists, geneticists, statisticians, data analysts, and biologists all working together at the Discovery Center to solve the problem.

Professor George Mellick:
That's correct. And that is the main mantra that I have for people, particularly the young scientists coming through the system, and that is, you need to have a really good understanding of the overall process of science and you need to be able to integrate information from lots of different places to study important, difficult and complex problems. And that's one of the things that I have in terms of a mantra for my students and just in general. Now, that doesn't mean that you don't need to have a disciplinary expertise. In other words, you need to have some specialty in a specific area because these days, you know, we do need people who have those really important skills in one area. But more importantly, we need to be able to, and we need to be receptive of the many different areas that exist and be able to integrate that information. And I guess that's why just the study of the STEM disciplines is critical for the community moving forward, because we need people in our community who are willing and able to integrate that information.

Speaker 1:
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Dr Terri Burnet:
George, can you please share some of your experiences about growing up in Mareeba in Far North Queensland and the sorts of things that triggered your interest in STEM from that early age?

Professor George Mellick:
Terri, I'm actually really proud and very happy that I grew up in Far North Queensland and in particular in a place like Mareeba. The education that I got was absolutely excellent, not just from the fact that I had some really dedicated teachers who worked very, very hard to give us the best possible education that we could have, but also because people who live in the country are extremely practical. We have a totally different approach in many ways to you know people that live in the city and who have a different lifestyle. I think that growing up in the country and learning from people who were working on farms all the time or just working in the community, have to be practical just by the nature of life. I think that teaches people a lot of really important skills. So that's one thing I think I'm really grateful for.

Professor George Mellick:
The other one was that because when you live in a small community, everyone knows one another, everyone's in it, you know, together, it's kind of a different type of community. And so it was a really great place to grow up and find out how lots of different people live, whether it be people from the indigenous population or whether it be people from different ethnic backgrounds. I mean we were all just in it together. I think that's also an excellent way to learn from one another and to sort of pick up different skills.

Professor George Mellick:
In terms of my interest in science, I just think I've always been curious and the sort of person who was asking why, when you saw something happening, trying to understand things. And I think anybody who's got that curiosity is someone for whom science is of interest. I always wanted to find out how things worked. I guess that's where my interest in science comes from. That background is still really important to me today. I still really love coming home up to Mareeba and visiting my parents and my family up there and my sister who lives on the Atherton Tablelands. I still feel like I'm a far north Queenslander rather than a Mexican from Brisbane.

Dr Terri Burnet:
As an enthusiastic and passionate advocate for STEM, what advice would you have for students interested in pursuing a STEM-based career?

Professor George Mellick:
Go for it. The biggest piece of advice I have however is, make sure that you do maths. I know a lot of people will shriek when I say that, including many of the scientists that I know because people find maths often to be difficult. But persist because I think one of the most important things that a scientist needs is a good grounding in mathematics and in logic and not being afraid of maths. You don't have to be a huge mathematician and I'm certainly not a mathematician, I can guarantee that. But one of the things that's important which is don't be scared by math. Maths is all around us. It helps to explain many things. When you apply maths it can help us to understand science very well. So one of the biggest pieces of advice that I give people who are interested in science is to make sure that you also don't give up on the maths training. I think that's a critical part. It's not the be-all and end-all of course, but it's important that I think students take maths as much as they can, with the other sciences.

Professor George Mellick:
My other piece of advice is, you don't have to learn everything at once. It's a huge world out there. It's a huge life out there. Take it slowly, but enjoy what you do, whether you're interested in chemistry or biology or physics or something else. In essence, all of these things all meet up somewhere. My advice is just go with the flow and do the things that you're interested in and you'll find that you'll be successful.

Dr Terri Burnet:
How good do you feel getting up every morning, heading off to a job that affects so many people's lives?

Professor George Mellick:
Terri, it's a real privilege to do the work I do and I'm absolutely privileged that I'm able to be in the role that I have. Most scientists are doing a job because they love it. This is not advice to parents per se, but if you want to make millions of dollars, you wouldn't be a scientist, although some scientists can make millions of dollars. But scientists are interested in the world and when you have a job where you can actually do that as your job, it is a real privilege. I really love doing the research that I do. A lot of scientists are currently working on the COVID-19 situation. A lot of excellent researchers in Australia and overseas will come up with a vaccine in very quick time. There's also drugs that are being developed as we speak that will help to treat people with the infection. Education is really key and that's the way we're going to get out of any of these situations that emerge, is by having people who have the ability to understand and analyze the situation and come up with really novel solutions.

Dr Terri Burnet:
Thank you so much for chatting with us this morning, George. We appreciate it.

Professor George Mellick:
It's my absolute pleasure. Thanks, Terri, it's been great.

Announcer:
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