FUTURUM
PODCAST

Dr. Timothy Hughes

In this podcast, **Dr. Timothy Hughes**, a neurovascular epidemiologist from **Wake Forest University School of Medicine** in the US, discusses his love of drawing and how he uses creativity in his research. He speaks about his meditation practice, how it helps him think clearly and better understand his own mind, and about how getting experience in a lab can be a great way to figure out what kind of research is right for you.

Break the podcast down:

00.57: Hello Tim, welcome to the Futurum Careers podcast. How are you today?
I'm doing great, thanks for having me.

You're very welcome, and it's good to have you with us. So, I start these podcasts with three quickfire questions that just help our listeners get to know you a little bit better. The first question is, what's your favorite sport?
Favorite sport, it would be soccer in the US, football abroad.

And the next question is, what's the most interesting fact that you know?
Oh wow, I've got a head full of them. I think anything related to the way that we see the world. So, I'd recommend Ed Young's book on the way that animals see the world. Just the way that animals can sense different things that we can't see has always been absolutely astounding to me.

And linked to that, if you could be any animal, what animal would you be, and why?
Great link to that! So, I've always wanted to be a California sea otter. I think swimming around all day and laying on my back floating and eating seafood would be wonderful.

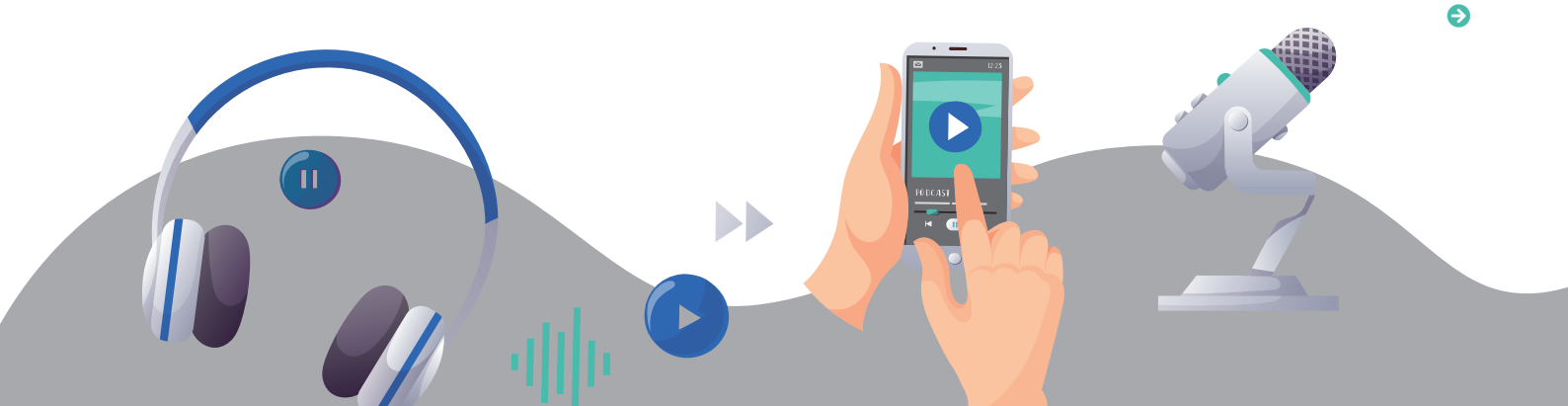
02.00: You're a neurovascular epidemiologist. Could you just explain to us a little bit about what that means and the kind of research that you're currently working on?
Yeah, happy to. So, it's a relatively new term. A lot of people aren't aware of it. Let's start with epidemiologist. I think a lot of people know about epidemiology. We went through the COVID pandemic, so you heard a lot about epidemiology in the context of infectious disease.

What we do is, we study what the risk factors are for getting disease that could be infectious, but it could be chronic diseases. I started doing epidemiology and cardiovascular disease, and how vascular disease contributes to not just cardiovascular events and death, but also how it affects the brain. So, that intersection between vascular disease and brain health is really where most of my research is.

And brain health is really complex. There are a lot of things that contribute to our risk for dementia. Vascular disease is a big part of it. So, that's why neurovascular epidemiology is a really exciting place for us to understand how we reduce our risk for getting age-related dementias and keep our brains healthy.

03.12: And like you said, it's a new field, quite a specific field. I'm wondering how you ended up there, and how your interests developed throughout your life. In your Futurum brochure, you even said that when you were younger, you thought you might be an artist at one point. How did you get from there to where you are now?
Yeah, if you had asked me this question when I was 10 to 15, I would have said, I'm going to be an artist. I want to be an animator. We all love animated shows, and I was no exception. I loved to draw. I thought I was creative. I knew I liked science, but I didn't think I wanted to be stuck doing bench work or at a computer all day. We're all in front of the computer all day now, so there's really not much choice!

But I knew that I was interested in helping people and helping people stay healthy and be healthy. At the time when I was young, I didn't know that there was anything else other than being a medical doctor. When I learned about epidemiology, it was a way for me to understand that there are opportunities to impact the health of large groups of people, not just an individual patient. So, we know about risk factors for disease and how



to control them to prevent various diseases. I wanted to do that.

And it first started with understanding vascular disease and then understanding that high blood pressure is such a risk factor for our brain health. That was really exciting. I saw the way that it changes our cognitive function over time. It causes vascular disease in the brain, and it can even cause atrophy in the brain where the brain shrinks over time. And that was really profound to realize that the health of our vessels really impacts the health of our brain. That's really what moved me towards this area of interest in that intersection of vascular disease and brain health.

05.03: And do you still get a chance to use your creativity and to be creative?
Absolutely. I would say that's probably the hidden thing about being a scientist – that we're constantly having to be creative, not only just in our day-to-day of creative solutions to the problems and the challenges that we face, but I'm a visual person – a lot of your listeners may be too – where I like to see things in pictures. And for me to really understand something, I like to picture it. So, I'm always drawing pictures. I have a sketchbook all the time. I'm trying to understand the conceptual things that connect these risk factors to brain health. And it's a constant integration where I'm using both sides of my brain every day.

You mentioned that creativity can help you when you've got challenges to overcome and thinking about things in a different way. I'm wondering what challenges you might have faced throughout your career, maybe when you were starting out and working your way up. What kind of challenges did you encounter, and how did you work to overcome them?
I would say I wasn't the greatest student. I was probably sketching too much. I was probably half listening in class, not daydreaming, but really using both sides of my brain, listening and sketching. And it was hard for me, initially, to really find what I wanted to do. I think all of us struggle with that. Some of us are still trying to figure out what we want to do with our lives when we grow up.

For me, school was, some parts of it came really easy and some parts of it were challenging, because I wasn't engaged with the subject. One strategy that I learned after some trial and tribulations in school was to really just understand that things are challenges to be approached and possibly solved. And even if I'm not that interested in it, finding a way to become interested in some aspect of it was really important.

As that started to click for me and became my strategy, I started to do so much better in school. That was really the first big struggle. The other was, there weren't a lot of good examples of opportunities. As I said, I thought if you wanted to be related, helping people with their health, then you needed to be a doctor or nurse or a medical professional in the clinic.

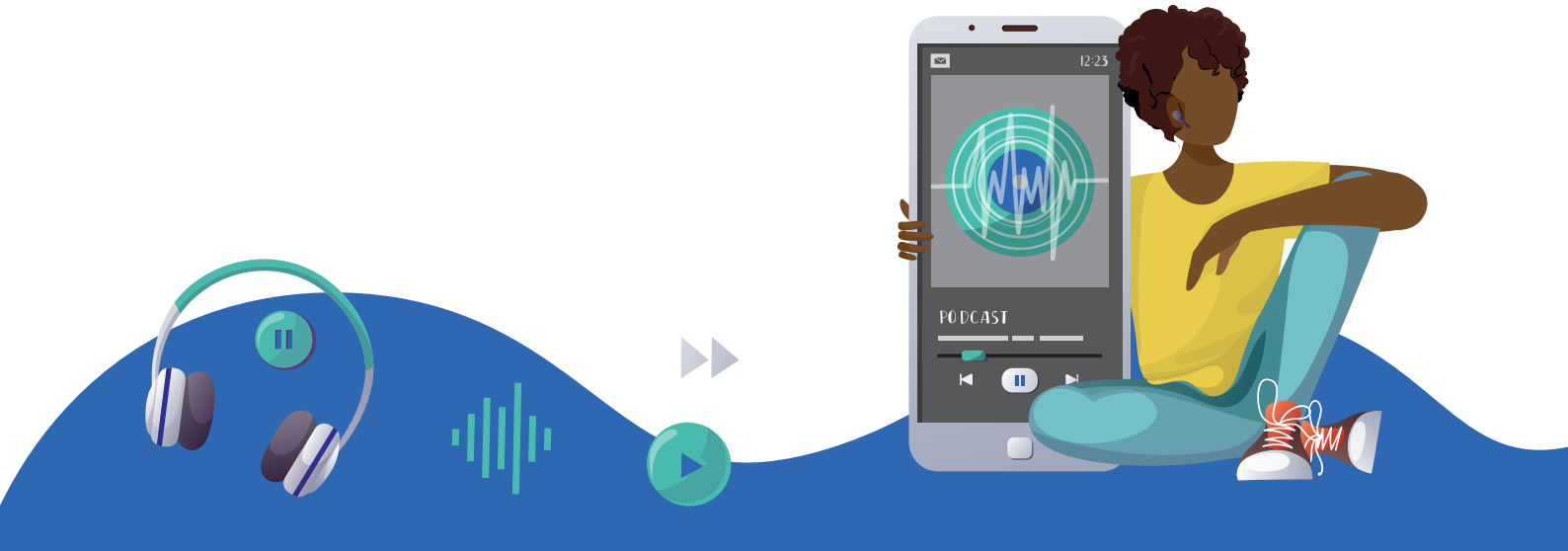
I think, and I hope, that projects like this where people are exposed to other aspects will let young people see that they can use the talents that they have to impact health in different ways, where you may not have to see patients in a clinic, but you can actually use the skills you have, whether it's math, art, research, interest in science. You can bring all of that together. And you can do that in creative ways.

There's a world of opportunities and many different jobs. And sometimes, we've stumbled our way there. Sometimes by happenstance, we find the thing that we were meant to do. And it's really rewarding to get to a place where you can use your talents that you didn't know how to use for the goals that you had and to then to be able to use them fully. And so, I hope that everyone experiences that in their life.

08.18: You mentioned there that what helped you overcome those first challenges in high school was changing your mindset and changing the way you thought about problems. In the Futurum brochure, you mentioned that meditation has had a big impact on how you see the world and how you think about the mind and different mindsets. Could you just talk about that for a little bit and what impact that's had on the way you approach things?
I'd be glad to. I've always felt that meditation has kind of been a secret weapon for me. I really didn't know much about it until I was 19. And I was going through a tough time in my life where things just weren't working out. A lot of stress, a lot of challenges. And what it allowed me to do was to sit down and settle and watch those feelings, the anxiety that I had, the worry, the depression, and watch them come and go.

So much of our time, we feel like we are our feelings, but in reality, we're different, moment to moment. Then, when I got into neuroscience, it was even more affirming that something that I've been using as a strategy to help myself relax and to think more clearly is actually really well supported by neuroscience. Our brains are dynamic.

It's an orchestration of so many different areas of our brains that involve our feelings. Constant connections between rational parts of our brain and those irrational thoughts and joys. It's a communication, and it's a conversation between different parts of our brain. I really enjoy



meditation to this day because it allows me to sit back and watch my brain work. Sometimes, you may not like what you see when you sit down. And sometimes, if you look at it, you can really be amazed at the way that things arise.

And sometimes, just sitting there allows you to see the answer to the problems that are ahead of you. But you really have to be able to step back, disengage from the worry and the stress. And meditation has always been a way for me to do that.

Being able to step back and view those things from an objective point rather than being all tangled up in them can be really useful when you've got some challenges and stuff to work through.
Yeah. And it's useful to think also that your brain functions like – we have these programs where we get into habits and we get into loops where we think about something and we're like, I can't get rid of it. If you try to get rid of it, you can't.

What you have to do is become okay with it and let it go. So, our brain's constantly running programs just like our computers do. And we can help change those patterns, but we can't do it by force. Sometimes we have to sit back and watch them and understand the process to be able to move forward.

11.10: Meditation is quite a personal and introspective thing. But for young students who are considering where they're going to go next in their career, if they're interested in STEM or in medicine, how can they find opportunities to get hands-on experience to get into the world of STEM?
Great question. There are lots of opportunities. Hopefully, learning about the path of others gives you some examples. Some of the practical ways to get involved are to simply reach out and look for opportunities. There may be a local university or researchers in your area that are doing something you're interested in. We do get emails, just cold emails on, "Hey, I'm interested in this." Sometimes, they're more specific than others.

But usually, when someone young reaches out with interest, many researchers are happy to engage if they have the time. Those of us who are researchers are all products of people who were kind to us and who gave us opportunities when there weren't opportunities. Some of the quickest ways are to go into laboratories where you're working with cells or animals. They always need people to help.

In undergraduate training, that's usually what people are doing. Working with patients and participants in observational studies and clinical trials, like I do, usually requires people to choose that as a career or to go into graduate school and want to do human clinical research and get that experience.

The other key aspect is writing. Many of us are taught to write prose and creative writing. I did not like to write scientific writing at first. That was a challenge. I thought I was terrible at it, and I thought it was boring. But the more I did it, the more I realized that not only was it important to get the ideas that I had out to others, but it clarifies my thinking.

Getting used to writing things and figuring things out, those skills can't be taught. You have to learn those skills. You can learn strategies to get better at it, but you really have to let yourself get comfortable with clarifying your ideas by writing them. People who do that and pick up that hobby come in and they write better emails, they write better papers, they write better reports. That's incredibly important because communication is key to every aspect of science.

13.48: I think that's great advice. It's all well and good being able to do the research, but if no one understands it or if you can't share it with anyone, then it doesn't have the impact that it should. Do you have any final advice for students who are at the start of their journey? What would you say to yourself looking back? What advice would you give?
If I could go back and give myself advice, I was probably too timid. I was afraid to ask for opportunity, for experiences. Sometimes you learn what you want to do by finding out what you don't want to do. I worked in many different types of labs over my training and many different types of research. There's always something that will make you curious and my advice is to follow that curiosity. Ask the next question.

When you get an answer, if you have more questions that you want to know, then you know you're on the right path. Curiosity is the biggest driving factor in a STEM career. People who aren't curious have lost the spark and the joy of doing what they do. I say to my nieces and nephews and my kids, find something to be a nerd about. Get into something to the point you don't care what anyone else thinks, whether that's a hobby or whether that's an aspect of science. Be curious. Ask the questions. See where it takes you. You might end up in a really beautiful place that you didn't expect to see.

Great. I think that's really good advice. Well, thank you very much, Tim. This has been wonderful. It's been really great to talk to you.
Thanks, Joe. It's been a pleasure to be here with you.

It's been a pleasure. Thanks, Tim.

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