00:00:03:08 - 00:00:33:18

Clare

Hello and welcome. I'm Clare and you're listening to Microbe Talk, the podcast by the microbiology society. I'm very excited to bring you the first episode of Microbe Talk in 2025. For this episode, I spoke to Professor John Tregoning about the experiments, thoughts and skills behind his new book, Live Forever A Curious Scientist's Guide to Wellness, aging, and Death.

00:00:33:20 - 00:00:39:00

John

My name is Professor John Tregoning. I'm a professor of vaccine immunology at Imperial College London.

00:00:39:02 - 00:00:49:24

Clare

Welcome to the podcast. So we're here to talk about your second book, Live Forever A Curious Scientist's Guide to Wellness, aging, and Death. Could you tell me a little bit about it?

00:00:50:01 - 00:01:12:08

John

Yeah. So I, about two years ago, I started, I look, I noticed that my hair, which I assumed was blond, is beginning to have streaks of gray in it. And I also noticed that, when I stopped to look at my phone, I was holding it further and further away. And there were just these gradual, subtle, and not so subtle signs that I was aging, and I was no longer the 20 year old that I thought I was in my head.

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John

And so I, began to explore what the likely things I might die of, and the kind of the risk for me as a, as a, as a man living in Britain in my 40s and then went through the different types of chronic, non-communicable diseases. Sort of in the order in which I was at risk of them and looked at, for example, I looked at the heart.

00:01:37:17 - 00:01:49:05

John

How does it work? How does it go wrong? What's changed in the way that we treat heart disease in the last 50 years? And then it was there anything I could do about it right now to kind of extend my lifespan?

00:01:49:11 - 00:02:02:18

Clare

So you mentioned non-communicable diseases. So those are diseases that aren't infectious, but you're, writing about those, but you're a professor of vaccine immunology. What led you down that route?

00:02:02:20 - 00:02:30:22

John

So I guess I covered communicable diseases in my first book. Infectious. And so this this, it did spring a bit from a conversation with, book agent, and she was saying, well, let's think about write about the body. More generally, immunology plays a massive role in aging. And actually, vaccines are really important in healthy aging. So there's lots of diseases that if you get vaccinated against, will give you not only protect against the disease, but the long term effects disease.

00:02:30:24 - 00:02:55:06

John

So influenza vaccines, for example, also having influenza makes you much more likely of having a heart attack for the following year. Afterwards, if you have an influenza vaccine, you're less likely to get severe disease and less like to get a heart attack. The two words sort of do overlap, and in terms of writing it, I it was really enjoyable because I got to kind of revisit things I hadn't really thought about since, school or maybe beginning university.

00:02:55:06 - 00:03:00:23

John

And you kind of get to discover new things that you didn't or didn't know before.

00:03:01:00 - 00:03:17:20

Clare

Yeah, that's why I love science communication, because it's like you're always learning about something. So it was it like, did you find it difficult revisiting things that maybe last touched until university or, was it kind of quite easy for you to get back into it?

00:03:17:20 - 00:03:40:07

John

It was, it wasn't actually that difficult. I one of the things I found really hard last time was writing about my own area in a way that was more concise, because I've been because it's a you know, more about it. It's hard to pick the things that other people might find interesting or to share it in a way, it's easy if you don't know as much, it's easier to find a way into it and to make the stories more easy.

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John

So, I actually found it. Okay. And it was. Yeah, that just, you know, picking up anecdotes and the bits of the history about how things were discovered was, was really fun.

00:03:51:17 - 00:04:19:14

Clare

Yeah, history medicine was my favorite GCSE mojo back then. I was at school, I found I read your chapter about, brain diseases today and the history of how kind of things are named after certain people and, and how it ties into kind of European history as well, is really interesting. Are there any other particular anecdotes of things like that that you learned that, were particularly like your favorites?

00:04:19:16 - 00:04:43:20

John

One of the yeah, one of the things that's really interesting is thinking about diet and the different types of diet. And, there was, a, researcher called Doctor Keys who came up with a whole he was a kind of polymath. He did a huge range of different jobs before we got into science research. But he also researched on the effects of altitude on the human body by by living at altitude himself.

00:04:43:22 - 00:05:10:08

John

He was then very involved in developing this thing called the K ration, which was a type of food the American Army used in set World War. He did an almost unique study on starvation and then feeding people off to starvation, where he, volunteers had been conscientious objectors during the Second World War, volunteered for the study. They went on to kind of a starvation diet for three months, and then they're fed them in different ways.

00:05:10:08 - 00:05:33:03

John

And so he did all of this, and then he moved on. He was the one who was involved in the Mediterranean diet. So he did a very large study of cardiac disease. And he looked at a number of different countries Finland, the USA, Italy. And he compared their diets and then their risk of cardiac disease. And he he observed that the countries with the kind of the more Mediterranean countries tend to have a low risk of cardiac disease.

00:05:33:09 - 00:05:48:01

John

And he associated this with, you know, healthier eating. Olive oil and this sort of the things that led to the Mediterranean diet. So said this journey he'd been through to get to the point where he was kind of interacting with the aging fields, really fascinating.

00:05:48:03 - 00:06:02:09

Clare

And it's interesting you mentioned a little bit of sort of self-experimentation there. That's a factor of kind of your research and a key part of this book. How did you find that to start off with.

00:06:02:11 - 00:06:07:00

John

Yeah. So there's definitely a factor of the research in the book, not of my actual data of research.

00:06:07:02 - 00:06:08:13

Clare

That would be interesting.

00:06:08:15 - 00:06:37:05

John

Yeah. Very different. But the, the it was, it was, it was fun. So some of the, one of the things I did was go on a very low calorie diet for a week. I also tried to measure during that. I tried to measure my, sort of feelings. I did a very simple kind of anxiety, depression type school, and my anxiety peaked at the beginning, just before I started the diet, because I had no idea how I was

going to behave, what it was going to be like to be kind of chronically calorie deprived for a week and then went through the week.

00:06:37:05 - 00:07:02:10

John

It wasn't much fun. I wouldn't I wouldn't recommend it, but the my staff at work were like, oh, you're less grumpy than you normally are because I think I just had so little energy that I didn't have time to go myself. I also just sort of rediscovered how much food as a central social element in my life. The lunch at work and lunch, your family just thinking about what you're going to cook for the evening.

00:07:02:10 - 00:07:11:05

John

And it played this huge role. And then when it's taken out of your hands, you sort of. I was missing a bit of my kind of normal social interaction.

00:07:11:07 - 00:07:22:13

Clare

And sounds like you probably wouldn't bring that into your day to day life. But is there anything from your experimentation that you have that maybe worked well that you're potentially going to bring in?

00:07:22:15 - 00:07:46:07

John

I one of the things I think that has changed slightly was they so eating more vegetables, I, I didn't eat less meat in the week, so, so that, having a high, a high level of red meat is associated with bowel cancer. And so the actual the level is in the risk level is very you don't have to eat very much to be in a higher risk group.

00:07:46:07 - 00:08:07:06

John

So it's like two pieces of bacon a day. It's it's it's quite it's a surprisingly small amount. So the the easiest way to shift that is to move to a more vegetarian diet and I and that that is something that we, I tried and then have carried on doing a bit more. Not maybe not as avidly as I should be, but it has helped a bit.

00:08:07:08 - 00:08:18:04

Clare

And that's something you've maybe taken away from this. What do you expect your average reader to be like, and what do you expect them to take away from, from reading this book.

00:08:18:04 - 00:08:37:00

John

So I've kind of thinking about it in two ways. I think there's a, the one element, I think about it, it was like, like a health pension. So for people who are maybe in that in their 20s, lots of the things like service are all on a linear decline. You sort of peak at about 25, which is so depressing to hear.

00:08:37:02 - 00:08:57:06

John

Horrible. This is when your mid 40s is like, oh gosh, it's so even more down. But the higher you can get things in your 20s that gives you a longer run in. On the kind of health and wellbeing. So people with higher degrees tend to get less dementia. And that's probably because they've made more connections in their brain.

00:08:57:06 - 00:09:18:04

John

So as you lose connections that that's that's kind of more to lose. Likewise, your lung function declines on a pretty linear slope. So if you're if you've got your lungs big and healthy or your heart big and healthy in your 20s, then you might have more to lose then. So the so messages for the people in their 20s is develop healthy habits now and that will pay off for you.

00:09:18:04 - 00:09:36:03

John

Much like, you know, people probably don't want to hear when they're sorry. I wouldn't want to say in my 20s about how you are going to age, but it's a really important message. And then people sort of I guess my age entering the second half is just thinking about how, you know, how to our bodies work and how what have we learned about aging.

00:09:36:03 - 00:09:57:09

John

And it's, you know, the there's really fascinating data showing how people, the majority of people used to die of infectious disease, clean water and vaccines change that. But, you know, people do end up dying of something. So that then move to heart attacks. Then we had better ways of preventing and controlling heart disease. And it's beginning to change into cancer.

00:09:57:09 - 00:10:06:22

John

So you see a sort of a changing pattern in health. So, so understanding how your risk factors have changed and behaviors you can do to to help yourself.

00:10:06:24 - 00:10:26:18

Clare

So there's a slightly positive spin on that, I suppose, because I think when you initially sort of read the beginnings of the book, you're like, oh, so you're exploring all the ways that I could potentially die. So you try to you've done quite well at putting like a positive spin on those areas. But one thing you really did bring in was a lot of humor.

00:10:26:20 - 00:10:36:23

Clare

What was that like, bringing in humor and finding that line between being scientifically accurate versus the kind of sarcasm that comes through a few times?

00:10:36:23 - 00:10:53:06

John

I think one of the things I found when I was reading it back through, sort of, what if you write it in this terrible rush and then you submit it and then you get it back for edits, and there is a real joy of finding a joke you've made and you're like, actually, that's really funny. And I don't remember writing it.

00:10:53:08 - 00:11:15:24

John

At the, the certainly not in this one, but in the, infectious. There was a joke about penicillin and Fleming and I said, oh, in the end, he struck mold. You know, I was like, yeah, that's a great joke. And I'd completely forgotten the rest of it. So I enjoy, you know, putting the jokes in some people, you know, it's a certain it's a style and maybe some people don't want that in their science books.

00:11:15:24 - 00:11:32:04

John

But there are lots of science books out there. So. So one with a few. And the people who influenced my writing are, you know, it's Terry Pratchett and Bill Bryson. So they're they are funny writers and that's something I've, I think it's just got to seeped into the way I write.

00:11:32:04 - 00:11:42:09

Clare

Yeah. And especially as you're talking about such heavy subjects bringing in a bit of lighthearted ness to it is probably I think I get a bit depressed. Oh, that's really good. It wasn't funny.

00:11:42:13 - 00:12:05:08

John

Yeah. And I think there was a, you know, some areas are definitely harder to kind of build. You know, I slightly I got to the, the chapter about cancer or the, about dementia and it's like quite hard to to immediately think of things that are funny around this, but sort of just I think some of the discoveries in the way things were found kind of work through, and you can kind of make light of some of the aspects of it.

00:12:05:10 - 00:12:20:05

Clare

Yeah, yeah. Science is has to be so precise and so accurate and comedy kind of. Isn't that at all really in its nature? Do you think science and comedy have a place more generally in being kind of put together?

00:12:20:07 - 00:12:41:20

John

They are creative subject. You know, science is a great subject. Comedy is creative. The thinking about presenting ideas in ways that people understand them. I think they do overlap. I think academia and research is is complicated and we are very, you know, we get public money. So to explain to people what the value of what we do, there needs to be a whole range of different ways to explain it.

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John

And for some people it may be that, you know, reading something that's funny and sticks and the head is like, oh, okay, not the funny, you know, not the humor itself, but they can understand the research in a way to say, well, that's worthwhile. People should be doing this.

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Clare

Yeah. And it's interesting you mentioned about scientists duty to communicate to the public the value of the research. That actually brings them really nicely to talking about science communication more in general. You do a lot of it. What would you say, perhaps to one of our listeners who are in the microbiology field, maybe early career?

00:13:16:03 - 00:13:21:09

Clare

What advice would you give to them? If they wanted to get more involved in public engagement?

00:13:21:11 - 00:13:46:17

John

I think you have to find the bit that works for you and that you enjoy and get stuff out. There's lots of different types of public engagement. There is, you know, people go to science festivals and stand in a stall and talk to lots and lots of people. I personally don't particularly enjoy that or get much out of it, so I'd much rather do a written thing or a podcast like this, or where you're sort of maybe not directly 1 to 1, but in a bigger audience.

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John

And I think learning the bits of it that works for you and that you enjoy and that you can explain your science in the best format. So try the different ways that it's science communication and outreach. It's a huge, broad church and it's all valuable. I think about ten years ago was very outreach, was kind of focused on a very specific.

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John

It was like, unless you go to a school, that's the only type of outreach you should be doing. But actually the, you know, everyone needs to be learning about science. And like people, most people stop doing science at 16. So, so finding different ways to engage them with it. It's really important. That's the first bit. The second bit is it's about building a portfolio.

00:14:25:08 - 00:14:43:12

John

And if you've once you've found the thing you enjoy, do more of it. You have to practice. So you have to get better and you have to, you know, my writing a book came out because I came from writing a blog, which led to some magazine articles, which I did, but but without doing the blog, I'd have never got the magazine articles and then never got the book.

00:14:43:12 - 00:15:03:19

John

So you need to practice it. You need to have a portfolio that you can present to people and say, this is what I can do. Do you like the style of the writing? To just kind of close out that I did, I think my, the first book, I, I pitched something completely different and Caroline, who's my agent, said, no, that doesn't really work, but I like the way you write.

00:15:03:19 - 00:15:12:04

John

Have you thought about writing a book about infectious diseases? And so by having evidence of what I've done, it then led into the book itself.

00:15:12:06 - 00:15:35:20

Clare

Yeah. And I definitely found myself as like, I love science and I hate English. Get out the way. I'm not creative at all. But actually learning that writing is a skill that you need to lend time to. And people aren't just born incredible writers. So what advice would you give to someone who perhaps doesn't see themselves as a writer?

00:15:35:22 - 00:15:39:11

Clare

How do you hone in that skill and what's the best way to go about it?

00:15:39:12 - 00:16:05:17

John

Yes. So I've actually just spent the last ten weeks doing a creative writing course at work to to learn more about the process. And I think some of it is you've got to practice it, some of it is you

need to be taught and then some of it is read what other people have written about writing. So, what if you're thinking about science writing, there's a book called Writing Science by Joshua Schimmel, which is about writing paper science papers more than maybe, communication.

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John

But it has some of the tips. And then there are other books like Stephen King, the author wrote a book called writing, which is it's a really good book about how to write a book. And it but it's a it kind of gives you ideas about the creative and the craft of writing. So you do like you said, you have to approach it is a skill.

00:16:21:24 - 00:16:40:08

John

It's a learned skill. You need to practice it and you need to go and read a lot. There are lots of books about how to write. Some of them are very helpful. And actually I, I grew up in the 1980s in the UK, certainly because the UK, they didn't teach very much grammar in the 80s in English language.

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John

It was, that it was it was seen to be kind of restrictive of the ability of people to write. So we weren't taught grammar formally, or I certainly didn't learn it very well. And I have had to come back in my 30s and 40s and learn English grammar in order to write better. So so be aware of the gaps of what you can and can't do and kind of teach yourself.

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Clare

Yeah, yeah, that's that's really helpful advice actually. Is that, anything that you learned about the book writing process in the second book, more so than the first one? Well, is it is it worth the work? I suppose is my question.

00:17:17:16 - 00:17:36:16

John

Yes. I get the tremendous name drop, but I got through the first one. I got to do a number of like festivals and history festivals. And I met, an actor called Ben Wellborn who writes Ghosts and Horrible Histories, and he was really kind and said, you think about narrative. The first book is quite it's a little bit encyclopedia.

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John

It's like I do viruses and then I do bacteria, and then I do parasites. And there's no there was no story arc in it. Whereas this one, he he recommended a book about it. It's this is called The Science of Storytelling. And it was a it's a book about narrative. And he said, well, make the thing a journey, make it about yourself and go.

00:17:55:01 - 00:18:08:11

John

And that, you know, some of the experiments came to the idea of doing experiments. And he said, you you need to have a like a fourth act where it all gets a bit dark and then it has to have a happy ending. And so making it to a not a story has made it a much easier book to read.

00:18:08:11 - 00:18:35:20

John

I think the first one, the second, like people I know have read it much faster because it has this narrative, even that's slightly longer. It has this narrative flow through it. So learning about narrative was, I think, the the lesson from this one and enjoyable. Yeah, it has been really enjoyable. I got that, you know, it's knowing more about what comes next and like what opens up and the opportunities to, you know, come and talk to you and come and do engagement and festivals and things like that.

00:18:35:22 - 00:18:55:14

John

It's really exciting. And the yeah, I, I think I said to my wife after the first like, because it is a big chunk of work, I know I probably want to do another one. And then I sort of accidentally had this conversation with Caroline, and Cassidy ended up writing another one, and I'm like, yeah, I'm not sure I'm going to be able to persuade her a second time, so I'd love to.

00:18:55:14 - 00:19:10:18

John

I think I'd like to write more. I haven't quite worked out what on yet, but it's it. Yeah. Finding finding the right word and finding that right phrase and this funny, you know, finding funny, silly jokes to fit into a topic. It's it's just satisfying. It's like solving a puzzle.

00:19:10:20 - 00:19:17:00

Clare

Yeah. Yeah. I completely agree with you on that. And it's, is it a nice complement to your day job as well?

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John

Yeah, absolutely. It's, it's really I think it's freed me up in my day job in a surprising way. It's kind of it complements it. So, you know, you can fit in with some of the teaching. It's not directly helps. It's not going to help me, you know, research the details. Cellular immunology of vaccines. But thinking about narrative in the way I write a grant or thinking about narrative in papers and and just having this extra bit of my career in my life is, is really important.

00:19:47:04 - 00:20:02:19

Clare

Yeah, yeah. I wanted to go back slightly to the book, actually, if possible, you approach some elements of maybe what's best, like homeopathy. Kind of non. Do you mean Western.

00:20:02:19 - 00:20:04:10

John

Like non-pharmaceutical ways?

00:20:04:10 - 00:20:13:01

Clare

Yes. Yeah. How did you approach that? What did you find that difficult? It's an interesting area.

00:20:13:01 - 00:20:42:14

John

So I mean, I approach the ideas as I would a scientific research. So I looked for well controlled, large clinical studies and ideally the ones where there's multiple clinical studies that back each other up. So to say, I went on the power of the evidence to support the ideas. And I think a lot of the difficulty is, is that the studies often have a quite a diffuse endpoint.

00:20:42:14 - 00:21:02:21

John

So certainly in my field of vaccinology, there's quite an obvious endpoint, which is did somebody get infected? So if you're looking at doesn't RSV vaccine prevent infection, you can take 10,000 people, give half them a vaccine and have them not vaccine. And then you can measure who got infected in the two arms of the group. And that gives you a a very clear kind of clinical endpoint.

00:21:03:02 - 00:21:23:15

John

But if you're measuring cognitive decline, it's quite a diffuse endpoint. And then if you're measuring something where the intervention is difficult to control in a normal case controlled study. So if your intervention is singing, it's quite hard to disguise which groups in the singing group from the not singing group because they know very well which group they're in.

00:21:23:15 - 00:21:47:06

John

And then if you're doing something that's somewhat subjective in that, you know, self-reporting the outcome, if you if you all believe that singing helps you have a better cognitive function, you're going you're going to report that it adds. So. So the studies themselves were I sometimes, slightly more difficult in terms of the clinical output. So, so that that was a challenge to kind of think about it.

00:21:47:12 - 00:22:05:19

John

But I mean, I, I tried to be open minded about them. I think bringing it all together, the piece that kind of comes out at the end of the book is that the humans need to be social. The, a piece of evidence from the Surgeon General that said social isolation is as bad as 15 cigarets a day.

00:22:05:21 - 00:22:37:21

John

And actually, if you then start looking at some of these other approaches, they sort of non-pharmaceutical things like dancing and singing and yoga, they all have a social and a physical and a cognitive aspect to them, and it's those combinations of things. I think it's good for you. So it doesn't necessarily matter which one you do. It could be playing board games or it could be, you know, being in a choir or painting, but painting in a group or in a book club, that all of those things have, it's the social element is really important.

00:22:37:23 - 00:23:00:02

John

And it may be that that's why they're sometimes hard. The benefits are hard to tease out. And and humans are complicated. So, you know, somebody might do a bit of singing, a bit of dancing and a bit of running in the wind. That's all very difficult. I think the other thing that came up was that a lot of our static sticks are not designed for the complexity of information we have about people.

00:23:00:04 - 00:23:29:19

John

So the the student's t test that we all often we used in a lab, was developed by somebody to compare batches of Guinness for how, how like clear they are. And that doesn't give you much information about, you know, the total sum of human exposure in each person. So so the really difficult studies, I think and you have to go you had to sort of I had to kind of stack them up and see lots of Cochrane type analysis of ones where they've compared lots of studies together.

00:23:29:21 - 00:23:31:14

John

To try and find some answers.

00:23:31:16 - 00:23:52:15

Clare

Yeah, yeah, that seems really interesting. And actually, you know, like it's actually quite beautiful then that there's all this wealth of sort of obviously schools, the intersections and the complexities of science. But to bring it to where social creatures and we need each other is actually quite nice to hear. It's kind of a positive story out of all the ways you might die.

00:23:52:17 - 00:24:09:21

John

Yeah. And I think it was quite reassuring. I think it is sort of the journey switch from me worrying about dying, which I hope is an emergency. Like how am I going? How am I aging, how am I going to go through the next like the third or fourth quarter? That's it is healthy and I keep my health span as long as possible.

00:24:09:21 - 00:24:31:10

John

And the kind of the I did look at all these different things. I look at my heart and everything I try. I was like, it's not actually going to help me very much. And I don't think I can stick like that. The crazy diet I wasn't I'm not going to stick to a super low calorie diet, but discovering that if I join a running club, that's something I enjoy and it will actually be good for me or certainly improve the quality of my life.

00:24:31:11 - 00:24:34:02

John

It was like you say, it's a is quite uplifting.

00:24:34:04 - 00:24:52:05

Clare

That's a lovely way to actually end everything. In a really nice, positive note, it's been an absolute pleasure to talk to you and pick your brain on the world of writing and also exploring death and life and that kind of thing I thought was really interesting. Thank you so much for joining me, and it's been a pleasure.

00:24:52:07 - 00:24:55:07

John

Thank you. It's been great fun.

00:24:55:09 - 00:25:16:01

Clare

Thanks again, John, for a surprisingly uplifting chat about aging and death. And thank you all for listening. If you'd like to find out how you can get your hands on John's fantastic new book, you can find the links in the description. And you've been listening to Microbe Talk. If you liked this episode please leave a like or a comment wherever you're listening.