00;00;00;00 - 00;00;27;24
Cale
Welcome to Grin and Bare It. A show that uncovers the remarkable stories from one of the most demanding industries in the world — Healthcare. From inventors and trailblazers to frontline workers and scientific experts, we explore the biggest challenges faced in healthcare and how these brilliant people have solved them. I'm your host, Cale Donovan, an award-winning entrepreneur and co-founder of Bare, one of Australia's largest end of life providers.

00;00;27;27 - 00;00;52;00
Cale
On today's episode, we're diving into the fascinating world of tissue engineering and regenerative medicine. Joining us is Professor Tony Weiss, a renowned scientist. His groundbreaking work has earned him international acclaim. Tony is the McCaughey Chair in Biochemistry at the University of Sydney, and leads the Weiss Lab at the Charles Perkins Center, focusing on cutting edge research into tissue elasticity and repair.

00;00;52;07 - 00;01;19;28
Cale
Tony's resumé is second to none amongst a long list of accolades. He's been awarded an Order of Australia. The Prime Minister's Prize for innovation and the Eureka Prize for Innovation in Medical Research. He's authored over 300 publications, holds 167 international patents, and founded the trailblazing biotech company Elastagen. Elastagen was ultimately acquired in one of Australia's largest life science transactions in history.

00;01;20;00 - 00;01;51;03
Cale
In this episode, we'll explore the journey of Tony taking his groundbreaking research and commercialising it into a global company. His biggest insights and advice for people in biotech, and what the future of tissue repair and regenerative medicine can look like. Now, Tony has an amazing sense of gratitude and optimism, which is infectious. Prepare to be inspired by the extraordinary achievements and insights of Professor Tony Weiss. Hope you enjoy the show.

00;01;51;05 - 00;02;12;02
Cale
So Tony, I'm very excited about this episode. Thank you so much for joining and welcome to the show. So I ran through your list of achievements and awards, Tony, and I ran out of it. And so it's remarkable what you've done over your career. Starting out, did you think you would have this much success and recognition?

00;02;12;08 - 00;02;45;11
Tony
No, I didn't actually. So a lot of the success and recognition has come in two flavours. As you know, there's the stuff I've done commercially in the stuff we've done non-commercially. There was a lot of resistance to the commercial stuff, particularly, you know, the idea of, I figured if you

want to go out there and help people, you need to put things on shelves, right. And there was a lot of resistance, particularly from the academic community in the early days where they said, no, you're going to be a purist, you're going to sit in your ivory tower. And I just thought that was so wrong. So yeah, that resistance was certainly there.

00;02;45;17 - 00;02;52;23
Cale
Do you think that's what's led to why you have been recognized? Maybe more, more so than others in like, equivalent field?

00;02;52;28 - 00;03;13;16
Tony
Yeah, maybe. Yeah. I mean, I strongly believed all the way through that you got to do things the right way and bring things out because, you know, a major driver that gets me up in the morning is, you know, I can make the world a better place, right? And that's one of the benefits of being an academic. You know, being at university is you can think that way.

00;03;13;18 - 00;03;35;24
Tony
But, you know, the only way to really make things that can, you know, heal wounds better, and the list goes on, is to really put things on hospital shelves or in doctors surgeries and so forth. And for that, you got to step outside those ivory towers, you got to engage with the real world. And, and that really wasn't part of the culture for a long, long time.

00;03;35;25 - 00;03;53;21
Tony
I think, you know, the effort of me and many others, I mean, remarkable people has helped to change that over recent years. So, yeah, I think you're right. It has helped be, a little bit, be ahead of the curve somewhat to be recognized. And I look forward to a lot more people getting that kind of recognition too.

00;03;53;23 - 00;04;21;16
Cale
Absolutely. Like before we dig into some of the specifics about the elastin story in your lab and the work you're doing there, I want to always hearken back to your story. Yeah. When I tried to synthesise this, you've committed much of your life, actually, to effectively the elasticity of our tissue. So I'd love to hear your journey from growing up to discovering that this is the path you wanted to pursue and how that's evolved. Yeah.

00;04;21;16 - 00;05;10;20
Tony
Delighted to, and appreciate the question. So, so, from a very early age, I always wanted to know how things operate and how things connect. I guess I was the, the classical tinkerer, you know, very early on trying to take things apart, put things back together again. So it was

inevitable that I get into science. And so as part of the journey, I remember I was in the latter years of high school and I asked my careers counsellor. So, you know, I want to do medicine, but also want to do science, so in a research. So how do I do that? And the person advised me at the time gave me the wrong advice and said, well, you want to do research, you can't do medicine. And that was completely wrong, of course. And so following dutifully the advice of my obviously very well experienced careers counsel, I went into science.

00;05;10;27 - 00;05;35;24
Tony
I haven't looked back, but it was, I was always drawn towards the medical aspects of science and then in my first university, I discovered this amazing field called biochemistry, which is the biology and chemistry of life, all mixed together, you know, and that's just extraordinary. It's telling us how we can tinker with things, but at a molecular level, you know, how, how does the body work?

00;05;35;27 - 00;06;10;02
Tony
But literally, how does it work at the really smaller than you can see with microscope scale, which is just incredible. And so seeing how those parts will make us work was just kind of blew me away. And that's really where it's taken off. Eventually I moved through DNA, researching proteins and all sorts of things, and I came to realise that one of the key fundamental questions we got to ask is, how do our bodies function on a bigger scale than just those little tiny molecules?

00;06;10;05 - 00;06;47;05
Tony
And the RNA is closest. You'll need those molecules stitched together at tiny scale, making bigger and bigger parts of us to build us in 3D. Just like you need bricks to be able to build a wall, you need these little, little tiny bricks to build large parts of our body. Whether that blood vessels or skin or whatever. And so it was inevitable that we then shifted in my lab to understanding about elastic tissue, which can be anything ranging from lung that's elastic to skin. You can see flex to blood vessels and list goes on. And all these things are elastic in the body. But I made that mine on that basis.

00;06;47;09 - 00;07;18;17
Cale
I mean, it becomes very all encompassing quite quickly if you take the view that sort of it's the molecules that bind together. And so this is really what you're focusing on. That being said, it's a very specific area outside that you operate in and it's really important. I'm interested to hear your thoughts on the impact of, you know, the research, but then ideally the commercialization of that research. Do you have any thoughts on sort of the potential of improved health outcomes or the economic potential or other things where you really think this is the ‘why’ we do this?

00;07;18;17 - 00;08;02;26

Tony
For example, as we're sitting here having this chat, you know, we breathing in and out, right? So you need your lungs and breathe in and out. You know, you stop breathing. That's not good. Right. And so it turns out that the key to the, the expansion and contraction of the lungs is this substance called elastin, which is, is the body's answer to elasticity, which is my favourite subject area. You destroy the elastin, you destroy the function of the lung. As we're sitting here chatting as well, the, you know, I'm moving my hands around so and other parts of my body too. And so, you know, we need flexible skin. So if a skin is not flexible, for example, let's say stiff scarring or something similar, that's disastrous too.

00;08;02;26 - 00;08;49;17
Tony
So we need to maintain elasticity and skin. And the proof of that is the older we get the less elasticity there is seen, for example, in an older person's skin versus younger. And all of us know what the consequences of that are as well. And since they have the skin functions. But just to even think about the blood vessels to, you know, as our hearts beat up to 2 billion times or so in a lifetime, some people even more than that. But, you know, think about how many heart beats there are. Blood surges out of the main artery in the body, the aorta, to countless other blood vessels around. It's the main blood vessel. And in that you need elastin so that the blood vessel expands and contracts and smooths out the peaks and troughs of the heartbeat with that, that elastin.

00;08;49;22 - 00;09;20;02
Tony
It means that we die. And and so you know, you need this one single building block in these countless tissues, not even just confined to the ones I mentioned to make us work well. So it's only logical that we wanted to become one—to become the world leader in this area, because if you solve one problem in, for example, skin, you can start to look at other things like blood vessels and land and so forth, and you can do a lot to improve the human condition. So those are powerful drivers.

00;09;20;06 - 00;09;24;01
Cale
Out of interest. How far away are you from achieving some of those things?

00;09;24;06 - 00;10;12;06
Tony
Well, we're remarkably close with things like repairing skin. In fact, I founded a company that was really responsible for repairing human skin. And that's been a very successful story in terms of, for example, blood vessels. I love to chat about this bit later on in the program today if there's time. We've been making a series of blood vessels that you can take literally off the shelf manufactured. They're not alive, but on implantation into the body, when they're sutured in, stitched in, they then become alive and they can actually function the same way as a real blood

vessel does. So yeah, we're moving remarkably down the right path to making these very real things, and it's much closer than anyone would expect and think. And I'm excited about that.

00;10;12;09 - 00;10;22;20
Cale
Yeah. You know, it's funny, by the way, I had an observation I had, which is when you first mentioned my lungs, I immediately breathe in much, deeply and much more deeply. And so it's real.

00;10;22;21 - 00;10;23;09
Tony
It's to get out.

00;10;23;09 - 00;11;01;16
Cale
Yeah, exactly. To see the elasticity of my lungs just to make sure it's still in check. There's two big topics, I think, you, and you referenced it in your first answer was this initial resistance from probably the academic and research community to the commercialize product. And the second is all of these interesting things you're doing. And so I would love to start with that journey of Elastagen the company that you took and spun out of University of Sydney. I want to start at the beginning, almost of that incredible story. Can you provide the context for listeners of how it started, how it was built over time and ultimately spun out?

00;11;01;21 - 00;11;44;10
Tony
Sure. Happy to. So I'll start with a little anecdote and then links back to the academic world. So at that time, I remember having a chat with the dean so that someone is in charge of the whole faculty at the university, and he was my boss, and I was chatting with him because he had called me in and he said to me, Tony really should interact less with industry, just focus on your science. And I was quite shaken by this and I walked back and I thought, he's so wrong. And I, and I ignored him. And that's why things, I think, at least in part, have gone so well. You know, when you believe something deep inside that you know is right, you just go with what you believe is right regardless, you know, to hear what the naysayers just go straight forward.

00;11;44;15 - 00;12;32;22
Tony
So very early on I worked out that, you know, we really need to understand how our bodies work from a soft tissue perspective. And by that I mean, you know, we're not built out of concrete. We're not rigid, you know, hard machines, we're not built out of steel or something like that. We're flexible. Right. So we talked about a series of parts of the body that are flexible really, but just even looking at skin and so forth to as we discussed, you know, we, we move around, we flex. And so turns out the main building block that's used in our body for making that elasticity, that flex is the one thing— it's elastin. And I realised very early on that there are two things. One of them is that, you know, we have amazing power.

00;12;32;27 - 00;12;52;15
Tony
We could find ways to build elastin because the one single building materials used in so many parts of the body, it's the one building block that's used in all these different places. But the second of these is that no one else was doing it. So I thought, here's an opportunity to make a difference. If only I could find a way to make the building blocks.

00;12;52;15 - 00;13;14;06
Tony
Make the bricks, if you like. That can be all the symbols to make these fibres and sheets and tubes and so forth, that could repair the body. So very early on, the goal was to be the dominant leader in the field. And I was delighted when someone from Oxford University wanted to come to my lab. He joined the lab a way down under.

00;13;14;06 - 00;13;39;24
Tony
And we, we went to my office and I drew on the whiteboard this, this crackpot plan to do all this and he said, yeah, I mean, so Steve was the first person to get into this, and, and he was the first person I'd convince was worthwhile. And then eventually other people I've spoken with since that time also wanted to share the vision and the excitement to make the world a better place, to make a difference in all of this as well.

00;13;39;27 - 00;14;00;05
Tony
And that then gradually moved into us doing great things with science. We found a way to build this building block that makes elastin. We found ways to assemble. We've discovered the rules of assembly. It's as though someone gave you a brick for the first time, and you go, what does this do? You know, how does it assemble?

00;14;00;05 - 00;14;33;07
Tony
And you would turn around, say, well, you know, you can make a wall with that, or you can make anything you want. It's the same thing here, too. We found ways to make this assemble and we discovered the elegant and most beautiful ways nature operates. And we found ways to replicate that in the lab. And it's just us leveraging the, the beauty and the elegance of nature, totally humbled by it and discovering ways in which we tried to replicate the same thing as cells within a lab and eventually company by setting. And so the story goes.

00;14;33;11 - 00;14;47;15
Cale
And so you're sitting there, you've you've made this discovery. You know, it's obviously groundbreaking. You sitting inside a university at that point. What do you kind of do with that information or that breakthrough to get it to the next stage?

00;14;47;22 - 00;15;06;05
Tony
Well, a lot of people say it, don't sleep much. So actually one of the things I did was I've stayed with the university, but I've also separately commercialised the technology. So it's a finger in many pies on there. So other things too. And so what I did was I realised early on that we had to start to patents for the technology.

00;15;06;05 - 00;15;31;24
Tony
You know, patenting allows you to be able to commercialise without having a robust way, holding a piece of paper up and saying to the world, we're the first to discover this. We have the right to be able to progress with it, and we can hold off competition by really progressing it. It allowed us to be the best in what we were doing, not just simply in Australia, but worldwide.

00;15;31;26 - 00;15;54;11
Tony
And in order to do that very early on, I'm pleased to say that the early people who believed in us were people that Johnson & Johnson Research in Australia, a remarkable group of people led by Denis Wade, and there are other medical people associated with them as well. And I could mention them. But the gist of it was that, they, they shared the vision and they saw the opportunity.

00;15;54;11 - 00;16;22;21
Tony
And there was very early people to say, yeah, Tony would like to run with this with you. And eventually it turned out that for a restructuring of Johnson & Johnson internationally, that it started to shut down their Australian operations. But one of the last things the Johnson & Johnson Research did, which I'm eternally grateful for at that stage, was Susan Pond was to hand back that technology to the University of Sydney. So we were free to commercialise it that much further.

00;16;22;23 - 00;16;37;10
Cale
Pretty much all stories of success or innovation or anything else come with a slice of luck and timing really. You know, like it's just perfect timing that really makes the difference in many instances between something that is exceptional and something that didn't kind of get out of the gate.

00;16;37;12 - 00;16;42;29
Tony
That one little thing hadn't changed here or there. We'd be having a very different conversation now.

00;16;43;02 - 00;16;49;29
Cale
And so the relationship between yourself, the university and Johnson & Johnson, was that existing?

00;16;49;29 - 00;17;10;00
Tony
So much of this is, you know, we talk about luck earlier on, but also it's about interpersonal relationships, right, about people you know, it's about how you connect with people. You know, people often talk about science as being a white lab code thing. It's mysterious and, and all the ways. But actually it's very human, you know, it's like anything else we do in life.

00;17;10;08 - 00;17;56;28
Tony
It involves people. People interacting. You get a different types of people just like you get anywhere. And it's about the way we connect with each other. It's a very interpersonal thing. So the way in which I connected with J&J. And initially and eventually the way in which subsequent I did other things, such as, for example, founding a company was all about people, was all about connections, and also recognizing my strengths and my weaknesses, too, because, you know, none of us can do everything, and we need to be a bit humble on that and recognize that the best way to do things outstanding are to bring the best people around us. It takes a village, right? And you do that by getting the best possible people you can to do the best possible things, and then you get the best possible outcome, more likely as a result.

00;17;57;02 - 00;18;09;16
Cale
And so Johnson & Johnson leave Australia. There's a stroke of luck in that. They hand it back to the uni. And so you now, you have the the core IP. You own it. Where to from there?

00;18;09;20 - 00;18;29;18
Tony
So again that was Johnson & Johnson research. Again I'll always be grateful to them. So where to from there? So I realised that it was really important to to establish a company. It was pretty obvious to me by that stage that it's, it's a, I guess, a package or an object or something to which you can pull all these discoveries.

00;18;29;18 - 00;18;50;13
Tony
And by that stage, you know, we, we've started to have some quite respectable patents that were already granted. So now there's an international recognition we have. I certainly by that stage, gained a really solid reputation as the leader in the field of the last in research. And so I thought, okay, I got to found a company. And so two things happened.

00;18;50;13 - 00;19;57;19

Tony
One of them was, of course, I needed to get consent of the University of Sydney. And I had enough, thankfully, people who believe in Tony and go figure, right at the University of Sydney, but also had people who believe outside the University of Sydney, and they included colleagues at the Technology Park, which is just down the road at the University of Sydney And in those days, there were remarkable people. And Mark Bradley, Hamish Hawthorn, again, I'll be eternally grateful to them who then were able to not only say, yeah, you know, we can provide a location where your idea of a company can build up, but we can even possibly bring in some early stage money to actually had a fund sitting directly within the technology park. They gave us a tiny bit of money, which we instantly leveraged with state government money and built that up. And that was the first little inkling of opportunity and possibility that began to emerge. At that point, I realised, hey, here is a chance to actually make this succeed, even though that was just one employee at that stage, and that was me.

00;19;57;22 - 00;20;08;09
Cale
And so, maybe talk through then the growth through to sale, and particularly interested as well as, like, post-sale, like how your life changed in any way.

00;20;08;15 - 00;20;55;27
Tony
So yeah. So the, the journey has been a wonderful and a very rewarding journey. I best describe it as being a true roller coaster experience. You know, it's a whole thing where the stomach goes up and down. It was Mondays, great, Tuesdays terrible. Wednesday maybe working Thursday, amazing. Friday not so sure anymore. Saturday, Sunday night starts all over again. Right. And I got to stick with it. You got to have a mindset, a true belief that this is going to work, right? Almost a blind, irrational, that it will succeed. And I think that's common to a lot of company founders. Right. So what we did early on was, we're able to bring a remarkable CEO. You know, I was running things early on, but like I said, I didn't believe I could do it all.

00;20;55;27 - 00;21;40;24
Tony
And, and I think that's an important message for the listeners here too. You know, we surround ourselves by the people we think are outstanding. And so one of the people we brought in earlier on was Rob Daniels, who stayed with us as a CEO. Rob's an extraordinary guy. And he just, he, he had a PhD background and got into venture capital and, you know, companies. And he, a true, true to his form. And absolutely, like we discussed, he, he got bitten by the bug, the same bug that I had. And I absolutely believe that this was something worthwhile. Continuing with him and from Rob, it builds up to the employees. And we also could only do that because of the investment. And I'll just make this a brief set of statements.

00;21;40;24 - 000;22;32;19
Tony

All of this can be a whole story in itself, but we were able to bring in funding that forward on from the early funding. We have the first funding was what was called Beast Capital that came through from the Technology Park, and that was awesome. As we discussed, leveraged money with state government. But the first true big money we got enough to that was Series A around from Aussie venture capitalists GBS and Brandon. Extraordinary people on focusing on the east coast of Australia. It's a Sydney Melbourne access and they gave us millions of dollars to start off with, again believing what we were doing and then eventually got another round of funding. So everything eventually total about 19 million, which was a nice, decent amount. And that was not only a reinvestment by GBS and Brandon, but also additional investors that came through from international places.

00;22;32;23 - 00;23;02;28
Tony
By single example, the Wellcome Trust had invested through a grant in what we were doing, and then at the end of that, they, so, believed in what we're doing. They changed the funding into an investment in the company because they believe in us and the Wellcome Trust, has a wonderful international reputation and their investment at a wonderful credibility. And what we had then, in addition to that, we had investors from Japan and Korea as well. So you can see now we're getting international.

00;23;03;00 - 00;23;24;00
Cale
Yeah, I mean it's always illustrative of your journey, which is that side in academia. It started with a strong belief a lot. Then there's this moment of discovery. Then there's this. This is actually commercially applicable in many ways, and the opportunity is enormous. And so it's kind of like you, your fundraising journey has somewhat mirrored the, you know, the almost academic into commercial trajectory that you had as well.

00;23;24;03 - 00;23;56;11
Cale
So you've, you've growing the business really significantly. You're at this point of, yeah, you're now selling the business like a and I would love to hear again, did that change your life in any way? I'm not talking about financially. I'm just talking about your role or most of how you think about. I've now gone full cycle in the from research to commercializing this product or service to then selling the business to a much larger company. Again. How was that transition? Did you find yourself sort of longing for other things at that point?

00;23;56;18 - 00;24;21;07
Tony
Yeah. Well, I, so, were, there's a whole lot of very important stuff there, so I hope I'll answer it satisfactorily. So first of all, it has been transformative. I mean, for example, there's, there's a deep satisfaction knowing that I was right to stick with it because, you know, you try and ignore people. You just don't think giving you a good advice, right, that goes back to the days of my careers counselling, you know, wrong advice.

00;24;21;07 - 00;25;06;05
Tony
But, you know, learning from that and building up and doing something beyond all that. Yeah. So one of the big things has been serving as a role model for others, too. You know, a lot of people have come to me and said, gee, Tony, I wish I could do something similar. And so, I, I try and guide them on their ripples and stuff. Right. And teaching people how to fish. Right. And and so it's amazingly satisfying to see people, particularly here in Australia who say, yeah, I get it. You know, I can do that too. And it's just it's wonderful to see them doing that now. And there are countless examples. And so that's, that's been transformative. That's changed my life in terms of trying to show other people how to do things.

00;25;06;05 - 00;25;22;14
Tony
I think also showing people that, that we can do it here in Australia. You know, too often we hear negative stories from people about, you know, you know, what can't be done here, but actually you can, you just got to, not only believe in yourself, but you got to believe that, you know, the remarkable people around you can do things.

00;25;22;14 - 00;26;07;09
Tony
And I think it's important to have examples of that. And, and I think, you know, that's important too. So, so that's been transformative. But also, you know, now it's got to the stage in terms of the next step stuff where I'm, I'm consulting to advising big companies, you know what here and overseas and you know, that's that's showing you that, you know, you can keep on building on what you got. Things don't stop. They actually continue on. If you only can keep on trying to do that. It's a variation on standing on the shoulders of giants. You stand shoulders of those who've, who've helped you and and then they stand on your shoulders as well. So I don't know what kind of shape object I'm making here.

00;26;07;09 - 00;26;29;11
Cale
Totally. I mean, I think and you're getting this point of with like by showing people how you've done it, you've built this incredible reputation, and now you could argue you've really amplified your impact because you're like you're being involved with much larger companies again, or much larger organisations, which, you know, again, if you can change just a little bit, even the ripple effect of that is really significant.

00;26;29;14 - 00;26;47;06
Tony
Yeah, absolutely. And just briefly on that one, you know, if you really do want to change the world, that makes sense to engage with the world anyhow, right, and and particularly with those who have the ability, whether the be companies or whatever, and the enthusiasm, if you can share that enthusiasm to make a big difference.

00;26;47;11 - 00;26;52;14
Cale
If you reflect on that period yet your time again, would you have done anything differently through that journey?

00;26;52;14 - 00;27;30;26
Tony
No. I think it's been an incredibly invigorating ride. I think the truth with that is succeeded at the other end. You know what you comment really on about how luck plays a role and that of course does. And should we try and position itself as we discussed, in the right place. But, you know, who knows, doing things differently maybe wouldn't have positioned me in the right place, the right time and things wouldn't turn out the way they have. And I'm very happy with the outcome, as indeed many other people are. And I'm so enthusiastic about it that I plan to do it again and again to the perennial inventor. And, and I'm constantly enthusiastic about trying to do it. It makes a difference.

00;27;30;26 - 00;27;57;25
Cale
Yeah, yeah, it's really important people listening to, to get practical advice. And so I've got a few different types of folks that I would love some advice for, or your point of view on. The first is the researcher or academic who actually wants to take a leap. They've identified what you have that may feel like they can't or structurally it's difficult for them. What would be the piece of advice that you would provide someone in that position?

00;27;57;25 - 00;28;30;10
Tony
My advice is to get great advice from great people. If you're not sure about how you do it, you're not quite sure about where you do it and so forth. Speak to people who've been down the path before, and you'll often find the very generous of their time. But if you decide to do it and it makes sense, go for it. It's an extraordinary journey and you really can make a difference. And at the end of the day, you know, we want to really collectively make the world a better place, so why not go for it? It makes so much sense to do so.

00;28;30;14 - 00;28;54;10
Cale
The second is almost the shoe on the other foot, which is an entrepreneur who's looking in and kind of working with researchers, academia and how to not necessarily extract that into a commercial business. But they've seen the opportunity, but they're not necessarily, you know, the originator of the IP and other things. Is there any advice that you would provide those people about how best to approach that?

00;28;54;15 - 00;29;21;07
Tony

Yeah, a little bit. I mean, there's a whole story book if you like, and it's so fun that within a few gems, I hope the gems. Anyhow, you can decide. I've got some fun idea. So one of those is that because any, any business based on science, you're doing something which is a longer term stall project. You know, biotech for example, classical ten year turnaround that's how they have, was for us at least, goes on.

00;29;21;10 - 00;29;54;14
Tony
You want to make sure the foundations are strong. You know, it's like building a house. You got to have a very strong foundation. So you got to have great science. It doesn't have to be okay science. It has to be great science. And the best way to judge that is, is how great the scientist is, is doing it. And combined with that, how great the intellectual properties, how many patents other, can you make, or how much patent control, how much ownership you can have on the space. And if you had that strong foundation, it's a much better way to build a better structure after that.

00;29;54;16 - 00;30;06;19
Cale
Interestingly, how do you identify an amazing scientist, particularly if they're relatively early in their career so they don't have this stacked sort of library of a body of work? Is there a way to identify that?

00;30;06;25 - 00;30;36;18
Tony
Partly, yeah. I mean, a large part of this is the far in the belly. You know, someone's absolutely that you can just see that they're so animated they’re so into what they're doing. That's infectious. Right. That's that's a large part of it. But actually the, the scientific side of things is such that people who are really good scientists or great scientists, they're already showing signs of that, you know, maybe getting awards, they might be getting great papers and publications and great journals and so forth.

00;30;36;25 - 00;31;11;15
Tony
So that's already starting to emerge pretty early on. And most of time, you know, you can use your gut feeling. You know, you like we do when we connect with anyone else, whether it's a party or whether it's over a, over a beer or whatever. You know, you can pretty early on just use your common sense to judge whether that person's really making sense and whether there's something to that person. It's the same skill set as well. Just superimposed on that, you've got the chance of using the, the, the academic metrics, the university style things that I use to try and gauge whether someone's great or not. So that helps out.

00;31;11;20 - 00;31;46;28
Cale

It's interesting that, yeah, I'll, I'll butcher this by the definition of charisma is someone who's actually just incredibly focused and passionate about a particular area. It becomes like almost a centre of gravity, and it becomes charismatic because they're so into a topic. It's kind of a similar, similar ethos or less about a particular research area or something else. So if you find people who are just that motivated to solve a problem, it's probably quite a good start. And so the final piece of advice is for universities that, you know, have exceptional research across an array of different sorts of specialisms. How should they think about commercialization generally?

00;31;47;01 - 00;32;12;10
Tony
Yeah. Some do well, some do it really badly and everything in between. I think the key thing is to identify the winners and to let them run with it, support them. You know, whether it involves providing a support infrastructure, which involves letting them connect with people outside. The right universities are understanding that now, which is reassuring, I think we have a much better understanding of the importance of innovation.

00;32;12;14 - 00;33;09;16
Tony
But I think also, you know, there needs to be a regular reliance on role models, too. You know, there are people that have been down this path. And now a bad problem is that very often at universities, there's a, there's a willingness to make it happen. But because the day to day business is still the academic side, is still teaching students, which it should be, right. And commercialization is something that doesn't always sit cleanly and neatly there. I've often seen universities try to reinvent the way that they try and do commercialization, and not always do well. So that's, I come back to the idea, therefore, that you need to make sure that you identify the key people and you really help and support them, and that sometimes putting it bluntly, it requires just universities standing back and letting the right external places connect with those academics.

00;33;09;21 - 00;33;54;03
Tony
You know, we have so many more facilities around now, whether their technology, parks with their various granting mechanisms, whether they're catalysts that help to drive people through. Those around them much more, the universities will continue to struggle with understanding fully how to make that job work. But I'm pleased to say that, for example, there are shining stars at the university level that are now succeeding in that level. And the proof of that is you just look at the companies and the success stories coming out of those now, as evidenced by things like the Prime Minister's Prize for innovation, which is a nice piece of external validation, the highest innovation award in Australia that has recognized the success stories that come out of universities..

00;33;54;06 - 00;34;32;01
Cale

I think what's helpful also is the rise of, you know, the entrepreneur. And that's become increasingly more popular. And yeah, rightly or wrongly, because it doesn't necessarily completely illustrate how tough that can be. But certainly in the last decade or two, it's become much more in vogue. And so I imagine, you know, combined with what you described is in pop culture, it's increasingly more accepted to go on an entrepreneurial journey versus staying at an institution for your entire life. I think that kind of breaks the back of some of the, maybe the challenges you experienced, which was you can't do that, you know, that's it. That's impossible. Don't do that.

00;34;32;06 - 00;34;50;04
Tony
Yeah. It can be right. And being an entrepreneur, being an innovator is, is a good thing. Right. And, and I think those, those are the transformative things and indeed you've just got to take your phone out of your pocket to just weigh in. And the amount of innovation that goes to making just that one object alone. Right.

00;34;50;05 - 00;35;02;24
Cale
Let's switch gears into innovation, because I'm particularly excited about talking about what you've got going on at your lab. You touched on sort of the work you're doing, your blood vessels. What are the most exciting projects that you're currently working on?

00;35;02;25 - 00;36;20;05
Tony
So just to elaborate a bit more on the blood vessel for a few seconds longer, the image I have is a picture of seeing the one day, you know, was you are rushed into hospital and person says, oh, you know, you need a bypass or something similar. I need a new blood vessel. And, and then they say, okay, well, I know what size you are, size for B blood vessel, whatever. And then they reach to the shelf and they go, okay AB there's 1B, 2B, 3B. I could days before they take it off the shelf. And then they rush me into the operating theatre, rip open the bag, stitch in. And that's exactly what we've been doing now. We've been making blood vessels that we've already shown in test systems can be taken off and alive. They were manufactured. They consist of just a few ingredients, but when they’re stitched into the body, they transform into the geometry, the shape, the, the, the microscopic structure that's seen in a real living blood vessel. And even cells grow into their and organise themselves the right kind of way. And to me, that's quite extraordinary. I think that's really exciting, particularly because at the moment, you know what doctors need to go to various parts of your body and try and pull out those blood vessels, whether it's your leg or whether your arm or even part of your chest, to try and do that.

00;36;20;08 - 00;36;39;25
Tony
All they take, blood vessels that are made officially out of things like Teflon or Gore-Tex, which you know, more specifically, and you know those aren't ideal things to want to have in your body,

right? They kind of work, but they also block up. That's not right. So, there's clearly a need for those. So, we're doing that, and it's already showing that it's working.

00;36;39;26 - 00;37;24;03
Tony
We continue to progress that some of the other things we've been doing collaboratively include making an injectable. Someone comes into a hospital, let's say, and they've got a heart attack. We've already shown in a test system, again, not yet in humans. So I want to emphasise to the readers, we're not done this in humans. So a portion, cut off a blood vessels or heart attack replacement or repair to humans out there. But just showing you where we're taking this. Working with a cardiologist, James Chong at Westmead Hospital, we've been able to demonstrate in a model system, a material we've made in the lab can be injected after a heart attack into part of the heart and to preserve the heart so it doesn't decay away and go into scar tissue.

00;37;24;03 - 00;38;06;12
Tony
It stays as a fully functioning, beating heart, which is a big deal because, you know, I went on exactly this incredible at the, you know, and I know that usually, heart after heart attack that gets scarred and so forth. So this is to help prevent that process from occurring. We continue to work on skin repair as well, better ways to do skin repair. And we're also doing some work on, amongst other things, on trying to do wound healing in other parts of body. For example, we've been making materials that, now collaboratively, we're doing with the Hudson Institute and with Caroline Gargett, and more recently, Shayanti Mukherjee, where we're making implant materials in my lab that are being tested to improve pelvic organ prolapse.

00;38;06;17 - 00;38;28;12
Tony
As you know, it was a terrible history of implants that gave rise to shards of material that broken down and so forth. And, you know, it's, it's tragic stuff. Those have been largely withdrawn from the market now for a very good reason. And I've tried to make a material that goes in, does the repair and then just disappears, just dissolves away.

00;38;28;12 - 00;38;56;17
Tony
So all you’re left behind with is what the body's repair process has been, and you're left with natural materials. And that's a major theme in my lab, is to put something in, it then goes away. What you're left with is a natural repair after that. And that's a themes we’re out. And I want to see that succeed too, again, that's process in motion we can’t offer yet to people that I would love to see that happen as well. So you can see the things that keep me awake and keep me excited on a daily basis.

00;38;56;22 - 00;39;12;15
Cale

Yeah. I mean speaking, you speak to a layman, look I and my over arching sense is sort of wonderment and like admiration. Do you have similar sort of feelings in working in it? Can you see the forest from the trees when you kind of, in the day to day of it?

00;39;12;20 - 00;39;57;23
Tony
Yeah, actually I can, I guess that's experience that helps to see forests and trees, but that wonderment, that amazement you just mentioned there, it's always there. I not only like the kid in the candy store to this day, but I am constantly invigorated and reinvigorated by amazing people around me. You know, I want to tell people who are listening that, you know, we have the good fortune of having wonderful, amazing, inspiring people who are doing wonderful, amazing, inspiring things. And your listeners, the people listening to us today should be absolutely thrilled and reassured to know that amazing things are being done to help people more broadly. Just wait for it, the best is yet ahead.

00;39;57;28 - 00;40;26;13
Cale
So the example you gave of preventing or removing scar tissue on the heart, for example. Post having a heart attack, you could argue that's definitely preventative in the sense that, you know, if you can reduce that or eliminate that altogether, then, you know, subsequent heart attacks may be delayed initially or avoided. Is there other applications for the research that you do, which are classified in the preventative bucket versus the sort of repairing damage that's already done?

00;40;26;16 - 00;40;52;20
Tony
Yeah, there is, the most the stuff we're doing is, is, is trying to treat damage. We can actually see where it is. So that defines a very specific sight that we can do things. We've also been seeking to find ways to make sure that things are built better, or able to be treated even before disease manifests itself.

00;40;52;20 - 00;41;17;16
Tony
So it's kind of a variation on, it's like a hybrid of the two stories. So we tend to focus on, on either of those, particularly with the idea of recognizing that something bad has either occurred or has the potential of occurring and therefore is best for us to step in. So it's not so much a complete expectation of prevention, because it's been very much hard to know where to try, at least using the tools that I have in my armoury.

00;41;17;21 - 00;41;45;14
Cale
Yeah, I mean, I just projected out way further, which was the, you know, just, you know, have a sense of invincibility, but there's a world where you heal yourself very quickly. As a person, you can heal a lot of damage, like almost instantaneously. I'm not sure if that is sort of sci-fi stuff or

you actually believe over a long enough horizon, the technology could get good enough where humans can effectively have a lot of fast tracked self preparation with pretty much minimal to no scarring. Is that a future that you see?

00;41;45;14 - 00;42;10;07
Tony
A lot of the technology I've commercialised actually focuses just on that. And we've already done a series of clinical trials on people. So that's very real. We focus by means–example I'm about to give on injectable materials. Imagine you've got a syringe. Looks like a clear liquid. But a lot of technology has gone into what the liquid is made of. And it's actually one of its ingredients is the elastin and building material.

00;42;10;07 - 00;43;01;25
Tony
Right. And so what we demonstrated is, and we see this time, time again is either by injection in or by placing a larger material into the wound site, whatever. But we see an acceleration of wound repair. And I think that's incredibly exciting. Right. Roughly half of the time taken for wound repair, we can reduce the scarring that's seen. And I think that's amazing as well, particularly the injectables and furthermore, we can see that the result in  healing is taking place. That makes the resulting tissue look pretty well, the same as it does in the surrounding tissue as well. So, you know, the skin in adjacent regions and there's the region of skin you trace. It look much more similar now too. So I think that's pretty awesome. Faster healing and improvement in terms of the skin condition. Incredible stuff.

00;43;01;25 - 00;43;14;05
Cale
It's a hot button item. Is there any application of artificial intelligence to the work you're doing to augment, completely change, identify something out of the box which you know, we wouldn't have otherwise?

00;43;14;12 - 00;43;32;17
Tony
Yeah. You know, the reason I think particularly in terms of doing the research itself. So we make good use of humans collectively all feeding up amazing stuff. Right. And I think, you know, the originality of thinking thing is, is one thing. But on the other hand, you also need to make sure that you know, you do the right experiments, you do the right tests and so forth.

00;43;32;17 - 00;44;01;29
Tony
So I can imagine a time in the near future where we can conduct experiments in virtual space, right? I can envisage a time when we will not have to go to a research bench with pipettes and test tubes and so forth, and, you know, literally figurative sense that we'll be able to turn to AI and say, okay, well, here, 20, 100, a million experiments would like to do and tell us how you think this is likely to go.

00;44;01;29 - 00;44;24;18
Tony
And, and then the AI would be able to model those experiments to us and do the, you know, countless numbers of these and give us what are likely to be the probable outcomes of those in a relatively short period of time. We can then go back and do the real experiments based upon what the tip of the peak is, what the most likely most probable success stories will be.

00;44;24;22 - 00;44;44;27
Tony
To me, that would be an amazing opportunity for AI to be like a really smart assistant in the lab that's doing all this kind of extra stuff for you, but imagine how fast it would make science work. You know, science might have taken 5 or 10 years, might take one year, for example, to, to do, I reckon, the most exciting things happen.

00;44;45;02 - 00;45;07;27
Tony
Sparks fly at the interface. Right. You've got two things connecting. You're going to see sparks fly. You bring, for example, bond technology or tissue engineering is ongoing and AI together you're going to get a lot of interesting things happening. When those two things merge, they'll be amazing stuff. And that's one of the areas where I think things will be a massive accelerating process for us.

00;45;08;02 - 00;45;26;06
Cale
I agree, I agree, so we're coming to a close here. There's a few questions that I have. The first is you reflect on your life's work, the early journey into the Elastagen journey into your lab and all of the other, you know, exciting things that you're up to. What's been the most fulfilling part of that?

00;45;26;11 - 00;45;45;15
Tony
So I think there are many ways to answer this, but I think the most rewarding aspect of this, if I can phrase it that way, is a sense that personal achievement of when you build something that means a lot to you, whether you're tinkering with a car, try to make it work better, or whatever the case may be, you've painted something at some sort of crate about work.

00;45;45;19 - 00;46;34;10
Tony
I mean, it's the same sense of exhilaration to be able to build something out of nothing, right? It just begins up here and it becomes something extraordinary that goes from the brain, from the mind, to something which you can pick up. You can and you can see it. And that's amazing to talk about. Something that can sit on a hospital shelf or sit in an ambulance or whatever, that's wow stuff. Right. And and I think that's just it gets me up every morning. So I think that's just

incredible. But I think also the ability to, to transform the way that others see the world around us has been very exciting as well, so that other people share that vision. That's been amazing. And also to encourage people to say that they can do the same thing with their ideas, with what they want to do.

00;46;34;17 - 00;47;23;04
Tony
It's like, you know, the example I brought in the first person to pick up a paintbrush painted an artwork. But look how many artists are out there painting the most extraordinary pieces of artwork. So I, I think, you know, there's the chance to inspire, as I've done a lot of other people, and it doesn't matter whether it's because I got the top prizes, many top prizes in innovation in Australia, that's great to get that recognition. That and I, I'm certainly happy to receive those. Right. But I think that what I've tried to do as much as possible and hopefully succeeded with that is to inspire others. And, and I'm hoping through our chat today that that's inspired some people listening, the audience today to go out there and say, wow, I'm excited. I reckon I can go and do my, my thing now too. I want to go and do that. And to me that would be a wonderful outcome.

00;47;23;08 - 00;47;55;20
Cale
Absolutely. You certainly inspired me. There is another question in there which is burning after what you've just answered, which is I think as you described your story, you had this unique insight which it felt like no one else could say, you know, and this is a two part question. The first is, do you believe that those type of opportunities are still out there for people, and describe that you were able to see that opportunity by thinking differently, or it was just a sign of the times no one else was sort of looking at it.

00;47;55;20 - 00;48;35;21
Tony
You know, the world's a big place, right? And there's, there are amazing things out there. I'm reminded of the story of roughly 100 years ago.  There's nothing else to be discovered out there. It's just race is just hiding things up. And then of course, came, you know, on sign and quantum physics and who knows what else. The fact is that there's an infinite number of things for us to discover out there. Right? And whenever you turn around, there's always going to be something wonderful. And the world is and the universe is an amazing place to discover things in. So I have absolutely no doubt at all there was always going to be something amazing. You lift up that, that shell, you open that door, you're going to find things that are incredible.

00;48;35;21 - 00;49;11;29
Tony
I think in terms of the mindset, in terms of the approach, the key thing is to keep an open mind. You know, you, you keep the wonderment that you had as a kid or rediscover that wonderment. And it's amazing how much the world around you just looks fresh and new. That actually primes you to see things in a remarkable way. I'm fortunate enough that I get paid as a professor to see

the world that way, but I encourage everyone to try and see it the same way. You know, kids, kids get excited about the little things, right? Then, and you wonder, well, why did they do that? And so you see through their eyes you go, wow, that is amazing, right?

00;49;11;29 - 00;49;24;15
Tony
Why shouldn't we as adults see thing as the same kind of way as well? And if you do that, much more primes too, to make that amazing discovery and change the world around you. And that's what it's all about.

00;49;24;15 - 00;49;46;09
Cale
The, the final question here, Tony, is the podcast is called Grin + Bare It, because often it's the advice given to people who are facing insurmountable challenges. That might be a problem they solve, might be something else completely separate. I would love your words of wisdom to people who are facing adversity. What would you say to them?

00;49;46;14 - 00;50;12;23
Tony
Yeah, well, unfortunately, adversity is part of what we all face. So where, I'd first say to anyone listening who's facing that, that you shouldn't feel alone. You know, we all face adversity in various forms. Sometimes more, sometimes less. Stay positive if you can. You know the sun will shine tomorrow. The sun will rise again. There are amazing things you can do, and you just never know if you're going to bump into the next day,

00;50;13;00 - 00;50;31;14
Tony
You never know what kind of amazing thing will happen, and that wall will suddenly inspire you. And I would certainly say that, you know, I've been through ups and downs in terms of what I've sought to do, where there are times I thought, there's no way this is going to succeed or, you know, we talked about a roller coaster earlier on here too.

00;50;31;14 - 00;50;56;22
Tony
But, I mean, it's a single example, an absolutely convincing narrative that there's no way that it's going to work tomorrow. But I, I did believe the sun was going to rise the following day, and it did. And I would encourage everyone to say to themselves, “You know what, I'm going to try and seize the day tomorrow, even though today may be really lousy and I'll try and do something better with that.”

00;50;56;22 - 00;51;13;26
Tony
And that's what I've done, and I would encourage other people to see it that way too. It may not happen tomorrow, may not happen the day after, but, you know, keep on to it, keep on with it.

And and you know, you might bump into someone who suddenly makes it all that much better for you. And I think that's worthwhile, too.

00;51;13;29 - 00;51;38;18
Cale
incredible words like I've taken many things away from this, this conversation. Tony, I think one thing there is doing it together is also, you know, really, really important. And so I've got this overwhelming sense from you of, like, gratitude and staying open and optimistic and curious and being really thankful for the, the people around you who have contributed to like all of these things that you've built for your career.

00;51;38;18 - 00;51;50;16
Cale
And so I feel really honoured to have you on the show. You've you've dropped a lot of words of wisdom. I'd love to have you back at some point to talk into the specifics, but, until then, I just want to say thank you. And thanks for joining.

00;51;50;20 - 00;52;02;04
Tony
Well, thank you so much, Cale. Appreciate the opportunity. And thank you to everyone who's been listening here as well. I appreciate it very much.

00;52;02;07 - 00;52;32;12
Cale
Thank you so much for listening to this week's episode. I hope you enjoyed it. As always, I would love your feedback, questions or any suggestions that you have to someone that I should be speaking to next as our guest. You can find me on LinkedIn, or you can find the Grin + Bare It podcast on TikTok and Instagram. Now the best way to support this show, if you did like it, is leave your feedback, subscribe or wherever you get your podcasts, or simply share it with your friends and colleagues.

00;52;32;15 - 00;52;41;06
Cale
Thank you so much again. See you next time on Grin + Bare It.