Exosomes & Stem Cells: Breakthrough Science or Hype? Transcript

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Introduction to Doctor Talks and the Guest

We do have a machine called an XO view, which you can put a C 63 981 antibody on the surface and it will capture this. And so theoretically I can capture all the exosomes but not every exosome has C 6369.

A lot of them don't have 69 on them you know. And so it's the cargo that's in there that we care about. And so you're exactly right. I have to identify the cargo, not just the number of exosomes.

So we don't even care anymore. I mean, we give you a particle number, but what we really care about is the RNA and the the protein concentration. Welcome to Doctor Talks, the podcast where every episode leads to a healthier you.

Join us as we navigate the world of optimal health, uncovering groundbreaking strategies to conquer chronic disease. In each episode, we'll bring you the latest insights from leading health experts, medical innovators, and wellness warriors.

If you're seeking to transform your health journey, or if you're looking for answers to burning questions. You've come to the right place. Get ready to unlock the secrets of lifelong health and vitality.

This is doctor talk, real talk from real doctors on the issues that matter to you most. Hi, welcome to another episode of the Recharged Biomedical Podcast.

I'm your host, Doctor Edward Park, and today we're very lucky to be joined by Doctor Duncan Ross, who is a PhD immunologist and the founder of this exosome craze.

How are you, Duncan? Good. How are you, Ed? I'm hanging in. I wanted to give proper credit. So ten years ago, they started making exosomes. But this is a field that's only about 17 years old.

Astbury was joking that his car is older than the annual exosome conference, which is only year 13. So this is cutting edge stuff. And somehow this gentleman who is a trained Stem cell biologist, was working with stem cells and he had a doctor's wife who he was trying to help with her COPD and the cells wouldn't copy.

So somehow he thought to put the serum from the young man's cells into the old lady cells. And all of a sudden, lo and behold, they started copying. So what made you come up with that little bit of inspiration was an accident?

Or did you think, well, I mean, it was a lot of desperation because I have to I'm not a physician. I'm a scientist. So I have to partner with you. And, you know, my he was my partner's wife.

How Exosomes Were Discovered

And I was trying to explain to them the benefits of stem cells and, and why I was necessary. And if I couldn't get her cells to grow, then I wouldn't be showing.

Demonstrating myself is very necessary. So what they did know is that in the growth mediums that we use, there's growth factors. There's things like eggs, stuff like that, five ropes like that.

And you know that that makes cells that are healthy growth. And so I had this 18 year old paraplegic cells and they were healthy and they were growing.

But I had the seven year old cells in the same medium and then the same incubator. And they're not growing. So something must be missing. Right. And so that was sort of a deduction that there must be something in the young

one cells that that is different.

And so let me just see. And again it's not super ethical to be taking something from one person cells and throwing them on another person's cells. But because there could be pathogens or something in the in those cells.

But I wasn't planning on using these cells anyway because they weren't growing. And so this is my last ditch attempt. So by taking the supernatant. So that's the serum or the, the, the medium conditioned medium that the cells were growing in and putting it on the older cells, I slowly started to see these little dendrites going from one cell to the other.

But that required really, really careful attention. And I tried to have text copy that in later years and they said, I can't see anything. Well, because they're not desperate because I'm paying their salaries.

I mean, at that time I'm paying my own salary. And I had to look very, very carefully so I would come back and check every three hours, literally to see that these cells were growing.

And after a few days I saw that they were growing, and I ended up being able to expand those to confluence in that flask. And then I split them, and I grew them again.

And it was just just amazing. Amazing. Well, let's back up for the newbies out there. So who don't understand. So we've always known about cells, stem cells, exosomes were ignored as cell poop even though they saw them being excreted.

So you didn't necessarily know that there would be exosomes in there. But for some reason you want to try it. And it worked. So for those that don't understand, you know, on the scale of 1/500 or 1,000th the diameter, these tiny little spheres are literally invisible less than 200 nanometers.

You can't see with a light microscope. And so it must be like the young music up 18 year old was singing to the old cells, and even though they're old cells and old dancers, they could still respond to the young music. So that's how I can tell people.

It's like they're healing like a newborn baby, because these are iso genetic. Unlike cells which have self antigens, your body doesn't know. It didn't make these high quality, potent exosomes.

Right. And I think that and we've done these experiments that you know the X the cells take up the exosomes and know those cells of the seven year old.

She has normal DNA, right? I mean, you could I mean, there's nothing wrong with her DNA except that her DNA was not expressing all the growth factors that the younger cells DNA was.

So those growth, those exosomes then caused her DNA to start expressing normal growth factors. And so they started to grow. So you're programing basically the older.

Yeah. So we can presume that probably as a result of methylation aka gene silencing, a lot of her capacity was shut off. So let's pivot a little bit. So you guys are celebrating ten years. Congratulations.

So I've been I met you over six years ago. I like what you had said. And I want to talk to you. Gracious enough to have me join you for dinner. And since then, it's been a wild ride up and down a lot of competitors have come to market, many of whom have gone out of business.

So, you know, it's a very slippery, kind of treacherous space. Everyone always comes in, sends their detail, man. And they say, hey, doc, I can get you three times the exosome for half the price.

And if you're a doctor and you're not really interested in the minutia, then you might fall for that. And a lot of people do. So when I went to the exosome conference last year, I talked to the manufacturers of these counting machines

and just cut to the chase.

No one can directly measure exosomes easily. This it's inferred from the Brownian motion of the particles. So a lot of these people just have the machine or get at the lab to say, you have so many particles and they're claiming to have exosomes.

So I think that's why, you know, I was a little late to the interview because I had to give one of our friends some chimeric exosomes. So I think that's why in the market, patients are actually asking for it by name.

So what's your take on people who switched brands because they're getting more for less? Is it like gasoline? Does everyone have the same potency? I have a lot of takes on that.

So one of my strongest competitors who's no longer is they have a really nice marketing, which was basically copied from mine. When I saw it there. I was like, you know, this looks a lot like mine.

Well, they, they they sent out their first batch for particle testing, but then they never sent out another batch after that. They just said, oh, this is how many particles we have.

And and they weren't using clean rooms and all these things, you know, that you would not imagine as a clinician. I mean, when somebody comes in and sells you an exorcism, you assume they're using a clean room, right?

I mean, if you if you're like, well, there weren't. And and when you think about there have been a lot of people and like you said, that have gone out of business.

My very first competitor, which was a company called You Site in 2018, or maybe they went out of business in four months because they contaminated eight people with E.coli.

As soon as they started trying to make an exorcism. Now the FDA shut them down. And so that's what the FDA has been doing, is whac-a-mole going and shutting everybody down?

I think rightfully so. Yeah. And, you know, so people say to me, well, you're using this brand of exosomes, I use your brand. What about this FDA letter?

And so I always tell them an FDA letter. It's like a badge of honor. You know, if you're still out there producing and the FDA has come and looked down your throat, inspected, that you're probably pretty good.

Whereas a lot of these companies, they have at so price and they white label, they don't even make this, which means they have no control over the quality, the manufacturer.

And like you said, you don't know what you don't know.

Why Cargo Matters More Than Particle Count

So you maybe having a working cell culture that's six months old, all those cells might have already shortened their telomeres mutated, have abnormal karyotype and their exosome payload is poor or different.

You could you could expand the cells too far. We don't do that. Or the the FDA made us prove that we don't do that. That's how we got approval. Yeah. You have people out there that are white labeling or marketers, and they're proud to say that they don't make the product.

They also don't have FDA. And and so when you look at, okay, we got a warning letter that said in there that we shipped Non-Sterile product, we did not ship Non-Sterile product and that the inspectors who came were kind of new at this.

And I've actually heard a lot of stories in the past week about how these FDA inspectors come in and they admit

that they've never done this kind of inspection before.

They're going down the checklist, and the doctor who they're inspecting has to explain to them what they're inspecting. And that's basically what happened with us.

And, you know, I had to provide them later with the sterility report. And they go, okay, well, they didn't take down the warning letter, but I have to live through it.

So I but but then they came to inspect us again in August and they were there for one day and left. So the bottom line is, if I'm still in business, if you're still interviewing me, that must mean that I don't have a problem with the FDA, because otherwise they would have put yellow tape around the building.

Right. Exactly. So, but let's talk about whether this is legal, because a lot of people conflate the notion of legal, ethical, FDA approved. So just because you have an eye and, you know, there are certain restrictions you can still place on a company that's producing x, x itself.

So we have to be very careful both as, as you as a producer, how you marketing it. And me as a physician, I mean, there is a lot of consenting that goes on.

This is not FDA approved. It's not standard of care. And I and it doesn't mean really that it's going to be safe or effective. So I'm basing it on 3000 plus treatments over six plus years.

And I always tell people, look, there's a lot that can go wrong. You know, you and I could make up a home brewing kit for beer and it might be okay, but what?

I drink my own beer, you know, year after year, quarter after quarter, there's quality control issues. So take us through the steps in which a product can become compromised at the cellular level.

Foreign microbial like what can go wrong? Well, if, if, if you can equate it to the expiration date that we put on the vial when you first make a vial, you don't know what the expiration date is, right?

I mean, you have to go every year and retest the product. And then you can go extending our expiration date. So because we've been in business for so long, we have so many lots going back.

We now put three years on the vial because we have lots going back more than three years. And and if you have those lots and those lots have always been sterile.

And the cell line was tested in 2018 when we made it and afterwards for the FDA, and we had to test it for hundreds of viruses versus tissue products that you might buy.

Now they are called exosomes. They only have to test 12 different viruses. So there could be tons more things in there. And that's what the FDA required for our eye and the approval.

So when you have ten years of history and ten years of safety, that really says something because an exosome product could come on the market tomorrow and this is what happens.

And they take a medical cord blood and they sprint down. And then they call that a next time zone. And it takes about 24 hours to do that. The blood comes, they package it, they send a few off for sterility and then they sell you the thing.

But you don't know that those other vials are not contaminated. We literally. Yeah, yeah. I mean, that's why, you know, I was talking to a patient last year who said exosomes have been huge in Japan.

But again, some people died from a bad batch from an immature manufacturing process. And that just takes the whole field back. Just craziness tracks. Right.

And it gets labeled, you know, exosomes kill people, right? So right. And then when the FDA comes in your lab, they they don't know anything about exosomes.

They just think exosomes are dangerous. And and so taking a lot of convincing, I think to get them to where they're. Yeah, I mean, every other week I get a manufacturer saying, hey, doc, we want you to try exosomes.

And I'm like, well, listen, at the end of the day, I'm not going to put it in my body. So I don't know how you make it. That's a problem. So why should I put it in someone else's body?

I mean, this is an example of what I got today and just say, you know, it's expensive, but you don't have to do it intermittently. Every batch has to be, of course, tested for fungus and no toxins.

Sterility, potency. But just to give you a list, there's almost 40 things. Happy hep C, Htlv, CMA, syphilis, Zika, malaria, you name it. And I've heard from, you know, good looking people in suits that, hey, the more donors you have, the safer it is.

And I couldn't possibly make sense. That's like saying, well, the more sexual partners you have, the less likely have an STD. So there's a lot of people who really don't know what they're talking about, the space, and they're just pushing product.

Right. And you just mentioned Zika and malaria. That's not something a tissue provider has to test. And you're right, because of the way I did it, I only had to do it once.

It still cost me $1 million to do it, but I only had to do it once. So when when a tissue provider does it, they're not going to spend that million dollars.

And every lot they only get 300 vials out of it. So it's just not cost effective. So it's more expensive for me to do it my way. But it's also safer. Yeah.

I mean, and you know, I know that you have proprietary intellectual property and things that you do, but without getting too much into that, you know, a lot of the vendors, they don't do size, exclusion, size, inclusion, filtration and then resuspended them in pure normal saline.

So we're not getting like exosomes. We're getting a lot of particles, which could be good, could be bad. You know, when I went to the international science thing, I asked the question, well, what's in the bigger ones?

What's in the smaller ones? And it might be the same kind of content, but the smaller ones less than 3040 nanometers x some years. Typically those are not the ones formed in the cell that we can see.

So you took it a very conservative approach. But now there's people in the marketplace selling just controlled media, and they've been doing that. And one of your competitors that was pretty popular for a while.

I remember talking to him. He said, ours are 300 nanometers. This is much better than 100 nanometer canonical exosome or standard exosome. So I thought, yeah, that makes sense.

Like whatever for three pi r cubed that's bigger is better. It might be better. But again it's not the standard exosome that's produced in the in the summer multi vesicular bodies.

But what are your thoughts on these people that are marketing just controlled media. First of all we age because our telomeres shorten and our stem cells deplete.

But what if we could support both? I've been taking care 65 for 17 years. It's the only supplement I trust to support better mood, better sleep and exercise recovery.

At age 57, I don't have any gray hair and I don't need reading glasses to 65 is available now. Go to Recharge

biomedical.com MTA hyphen 65 and enter promo code Recharge ten to save 10% off well conditioned vision media.

I just spoke to somebody today who you know, they were sold, quote unquote exosomes. She took an IV and then afterwards they told her, oh, it's the secret tone, which means condition, meaning, you know, but didn't tell her then that I'm not taking condition.

Maybe. Ivy, that's dangerous. I mean, the reason that I isolate the zone is specifically for purity and safety sake, for reproducible product. And that's. You're right.

Manufacturing Quality, FDA Oversight, and Safety

I mean, you may be able to demonstrate that a 300 nanometer vegetable is better, but you need to demonstrate at first. I mean, I don't care what the size is.

I have ten years of reproducible data from guys like you that I know exactly the dosage of my zone. So and science alone is not going to come up with an answer for you.

You must have outcomes. And we've had and that's the. Yeah, I mean, you know, I remember Stella coronavirus we did a lot of stem cell and exosome research with premature babies at Harvard.

I remember I was in a video and I picked up on what she said. It's like, well, we don't really know. Like we know we have around this many cells, you can count cells.

And we know that in 24 hours they produced this condition media. And if we do our process, this is like what we're estimating and using the nano site to confirm that it's around this many billion, like millions of cells, billions of exosomes, but there's nobody in the world.

And I'm going to get another manufacturer on in a couple of weeks who I met. And we're going to talk about this. He says he can count the individual exosomes. Now.

I want to challenge that. But everyone has an estimate based on your standard operating procedure, how many exosomes are in there? But you do one other thing that you invented, which is of course, everyone has to melt the exosomes to crack them open and see what's in them.

So you actually have a quantification of the yield based on the mRNA and over the protein. So that's actually a measure of potency because let's be honest, no one can actually give you a precise number of exosomes.

They can guess the number part. But you can ask them this question. We do have a machine called an exo view, which you can put a C 63 981 antibody on the surface and it will capture this.

And so theoretically I can capture all the exosomes, but not every exosome has seeded 6369. A lot of them don't have 69 on them. You know. And so it's the cargo that's in there that we care about.

And so you're exactly right. I have to identify the cargo, not just the number of exosomes. So we don't even care anymore. I mean, I would give you a particle number, but what we really care about is the RNA and the the protein concentration.

And somebody who is trying to qualify or I don't know if you're trying to reverse engineer or qualify. So I was like, well, you know, we were looking at the CD 81 content of your exosomes, and he was asking me questions about that.

And I'm like, well, I don't know how you're looking at that. I don't know what antibody using to look at that. We've got, you know, we've tried we've refined this over many, many years and, and questioning me on on the lot to a lot reproducibility based on the amount of CD 81 that's that doesn't make any sense.

Right. And so our our response to him was, well the RNA concentration of lots was the same in the protein concentration. Lots of the same. So I mean he was trying to say that that now was less effective.

I mean, but he didn't even use the newer lot yet. He just, you know, and bravo to you because this is the cutting edge, the bleeding edge of science. You have to make up your own equation for how to crack open the exosomes and measure the potency that this is like science that doesn't even exist yet.

It's not readily adopted. But when you hear the scientists at these conferences struggle, they could probably adopt your method of bioactive bioactive units, and it would help them measure.

But again, I think the problem is that people don't understand what they don't understand. So because of the practice and the QA over ten years, you've had to invent stuff that no one else uses.

So you're always at the cutting edge of quality assurance. And so people just don't get it. They think, well, if I buy gas from Chevron and Texaco, it's not just gas.

Like, how different could it be? And I say to people, the devil's in the details. Like it's not hard to make an exosome. Stem cells just make them better.

Do the QA and validate the potency and the safety. Totally different ball of wax. Now make a comment on placental matrix jelly. How safe. What is that exactly?

Because I know that the source of your MSCs or your master, your Jango Fett stem cells that you clone and store that that's from a placenta. I don't know if it's caught or parenchyma, but we're talking about something.

It's not troppo blast. It's not from an abort fetus. We're talking about a live born donated C-section, clean placenta. What's the reason that people are injecting tissues, placental tissues?

Is that safe as an immunologist? Well, the answer is that the person who provides it to you, their answer is going to be, well, we believe fresh is better than the way Duncan does it, which is expanded.

But I believe fresh is dangerous. And so placental matrix or orange jelly is a ground up a really in a blender ground up tissue that you then add failing to.

And then you try to filtered out or not filtered out or whatever, or spin it down to try to get the bigger chunks out of there. And that's what people are settling.

So obviously it's going to have stem cells in it. They're not coordinated today, but there's a ton of stem cells in there. But then again, it's going to have immune incompatible MHC antigens.

Right. So your body's going to have some type of reaction host versus graft. Right. That always freaked me out because I mean that is what my PhD is in that reprojection.

And I know that you know, a lot of times you'll get by with the patient not responding, but sometimes the patient's going to respond.01 percent of the time the person is going to respond.

That's called the super antigen reaction to that HLA. And it's going to happen. It's just a matter of when. So now you got two problems with using fresh tissue.

You've got this rejection that you just mentioned. And you've got the potential for contamination that I mentioned before. And those are two possibilities.

Too much for me. Yeah. I mean I hypersensitivity I get asked a lot. Never seen it because it's so it means sensitive and people will say well I'm doing genetics stem cells in their immune privilege, but I can't get a straight answer.

Is there a engraftment? I don't think so. I mean, most of the people will say, you're these foreign cells that you're taking may last for a while and secrete their exosomes, but I think they talk out of both sides of the mouth when they're saying, oh yeah, they do. And graft, of course they survive.

What's your weigh in on that? Well, there's a reason that there are no FDA approved cellular therapies like that for Engraftment, and that's because the FDA doesn't.

First of all, nobody's been able to make it reproducible enough to get past phase three. And second of all, the FDA doesn't like DNA and products, period, because that offers the opportunity for for integration into the genome.

And they don't want that. Yeah. Well, I can tell you that third party I don't care if they're not immune privileged, they won't get rejected as quickly, but they're still going to get rejected in a period of 9 to 12 hours versus 3 to 4 hours that like, say, a macrophage would get rejected.

So, you know, that's just not true now. And that's that's intravenous administration. I have seen studies where if you put the MSC in Subcu, it gets rejected over a period of days, but it definitely gets rejected.

It's harder to track down in the virus's immune system to get to it. Yeah. Yeah. Right. And a lot of it goes to the lungs trapped in the spleen and liver.

So I mean, that's that. And people swear by it. And the margins are good. They pay a lot. They go to Panama, spend 15, 20, 30,000. Who knows. You know, anecdotally, the patients have no reason to lie.

Not much anyway. And so I don't think the response rates are as predictable as with exosomes, which is, if we're being honest, how the stem cells are working.

One more thing that's in the market is amniotic fluid exosomes. And, you know, I have used that with great success on very growth in one end of one. But I have to say that, you know, when we first met, I told this story about a patient that's an OB that died from the anti.

I almost died from amniotic fluid embolism. If it wasn't for the anesthesiologist giving them blood platelets, clotting factors. I mean her heart rate was down to 60.

Her SAT was down to 60. She was dying and she was bleeding from everything. So that could only have been an amniotic fluid embolism. So naturally I'm a little hesitant to use amniotic fluid products.

But there are some people on the market that tout that. And they actually I mean, what are they even doing? They're collecting amniotic fluid and just repackaging.

Or are they even testing it? Are they filtering it? What's your impression of those products? Well, I used to make those products right. And and I was filtering them.

I never suggested it for intravenous administration for the reasons you just mentioned. Because regardless if I'm filtering, I mean, you can have a ball, a vertex this big, or you can have a ball of for an X this big that still gets through my filter, but it's still there and it can agglomerate with other ones when it gets through the filter when you inject it. So yeah, that just terrified me.

But that's not even the reason I stopped making any other fluid because I was making amniotic fluid for articular injection. So I wasn't so worried about the embolism.

Placental, Amniotic, and Stem Cell Product Differences

I know the companies out there right now are selling it for I. V.. Like, it's no big deal. It is a big deal. I would never. Yeah, it's just cheap and easy to make.

And. No. And these companies don't want to admit it. And so. But the real reason I stopped was. And this happens to us with manufacturer or exosomes. If we change stuff, suddenly the zones won't have already.

And and and when they don't have RNA, we're not going to sell it because we know it's not going to be functional for some reason. Amniotic fluid exosomes did not have any RNA in them.

And I cannot tell you why they're creating one there. There's growth factors there, but there's no RNA. So that's why the the amniotic fluid, exosomes are not long term regenerative.

And the way one of our docs actually tells the patient is, you know, it depends on how much money you have. If you want me to treat you with amniotic fluid, along with the sense you're going to get about 6 to 8 months worth of relief if you use these exosomes, you're going to get a year to a year and a half.

What's relief? And that's because of what I'm saying. It's that remodeling of the DNA that's lasting longer than any amniotic fluid zone would be that interesting.

Now, you know, in the field of winemaking, they say that a bad year in terms of climate and stress on the grapes makes for a better wine. Are you finding, without divulging your secrets, that because I would think that there's some level of consciousness and agency in these cells.

So if they think everything is cool, they might not work as hard as to make, you know, anti-inflammatory, regenerative exosomes. Is that is there any truth to that, or is that just me hallucinating?

There's some truth to that. If you if you grow them in low oxygen, if you stress them on the ways, then you get different zones. I mean, mine are slightly stressed.

There's other ways to address it. But again, you have a playlist for them or Tchaikovsky. No, but but again, it needs to be reproducible. So I have FDA approval for this one.

I can't change the way we're stressing it. Otherwise I have a IT. And I can promise you that the micro RNA formulas would be different if I did that. And so we know what we've got.

We know we'll have those white RNAs that we we got approval by showing lots, a lot. They were the same. If they were all over the place, we wouldn't have gotten approval and so that's the issue with a secret tome or with cells is it is all over the place.

And then the FDA doesn't know what to do with that, you know. Yeah. No, I mean, I think that a word that people might not know is it's like the study of.

So you have to crack open the X cells with so and do the omics RNA omics which is two kinds messenger RNA and micro blocking RNA. But there's also proteins.

So in there in the grand scheme of things there might be some little bit trace DNA and lipids. But mainly that's the payload. So when we're thinking about this like give me a ratio micro to messenger to proteins.

Like what is it one to 1 to 1, one, two, three more micro than messenger. And they're just a bunch of proteins. And you're right. The first time I did a protein omics I, I did it with and without soap like you're mentioning.

And I thought I was pretty pretty smart for knowing how to do that. But that's stuff I learned in biochemistry. It's not stuff I learned in cell biology.

That's why the two PhDs were important. I got different outcomes. So, you know, there is proteins that are floating around, and then there are proteins that may be attached to the exosome.

Then there's proteins inside the zone. And it's just a pain to look at all these different things. But you have to you

know. But now they talk about the corona.

And maybe that compared to part of the function. Yeah, I compared the MSC exosomes to the amniotic fluid exosomes. And they were completely different growth factor I saw that readouts.

Yeah. No. Absolutely. So explain to us I mean you're doing the science. You're scaling a commercially available product. You're kind of counting on us doctors to not mess it up for everyone, but explain the stuff that you have there because, you know, I hear rumors of people that have moved from lab to lab manufactured manufacturing.

They're like, we were like in a kitchenette in the strip mall next to the check cashing place, you know? So you guys have a big facility, a lot of employees.

What, six spaces? Last time you counted? We have 50 employees. We have about six PhDs. We have a lot of manufacturing technicians that came from other big laboratories.

And and they're special and kind of hard to find. They need to be happy to do something the same way every single time. And I have to do a lot of things to keep them happy.

You know, they they have A44 day workweek, for instance. I mean, that kind of stuff. But it's nice to have them. And, you know, for good or bad, I might complain because it really eats into our bottom line.

But for everything we do, there's like three people doing it. There's how many camera technicians does it take to screw in a light bulb? Well, it's like 3 or 4 at once.

Two people watching one of them work. Oh, I mean, that's kind of what I got. You know, it's like, not hard to make an exit. No, but if you're going to do it out of a strip mall in Orange County, then you know it's going to come and catch up with you.

You know, you're not going to. And that's just what my intuition says. You know, from the moment I met you till now, you just pretty straight shooter.

So in the future, when can we get tissue specific exercise? And I know it's something you kind of had your thoughts on, but like, let's say, you know, conjure genic or originated or you're in stem cell originated, is that coming down the line?

I think the kinder Jennifer is coming really soon. I, I did have lots of different tissue exosomes years ago, but some of those were from fetal tissue.

And, you know, people don't like that. So that's why I focused on the placenta because it was the youngest ethical cell source. I could get. The at a conscious site is also going to be from an adult that basically so so that's doable.

So I want to do that soon. I'm looking at some other cell types, but we'll see if they're any better. You know, we didn't we we looked at neural stem cells and we didn't see them to be more effective than the MSCs we were doing.

I mean, I think the MSC is they do well in a lot of different scenarios as nature intended them and as we use them every day. But if we're going to wrap up here, I know you're you've had this thought to have joint ventures to submit to the FDA, like, let's say infertility, Crohn's disease, COPD.

Scaling the Business and Future Clinical Partnerships

And so you're starting to build a structure where investors can come in and partner with you. So that'll look like, well, we get the indication if it's approved by the FDA.

And hopefully they won't use they're very ham handed like small molecule model. They'll see the safety, they'll see

the efficacy and they'll get the dosing.

But if those go to market it could be profitable for a potential investor. So if somebody was willing to take that biotech plunge with you, how soon can they get on board as venture capital partners?

Well, actually within within weeks. And you just mentioned the some of the images. And so what I'm looking for is individuals who have a background in that field of going to be able to take it further.

So, I mean, you have a big background now and all kinds of things. But if you took you years ago when you were just finishing your ObGyn, okay, well, I'm trying to do an ovarian health I and you would be a good person to have that.

And I'm looking for 15 to $20 million per IND. And then people would get their shares and we'll move it forward through trials. And as you know we get to phase three.

Maybe we'll sell that to pharma. Maybe it's something that we want to keep. You know, I mean it's oh wait a second, are you looking for people with science and clinical touch points or can someone just with money as coming as a limited partner?

Well, somebody just with money can come in as a limited partner. But I also like to think of, of who might be the right CEO for that particular project.

Right. Yeah. So like, yeah, I know somebody and one of the local universities who has been doing some research for 6 or 7 years, and she runs a lab, is a MD, PhD.

See, that might be a good partner for you, for example. And she'll have her own funding sources, I'm sure, from third party. Okay. Well very good. I mean, doing a lot of exciting things.

I know it's been a really, really rocky road for you and there's been a lot of stress. So congratulations on as Elton John saying said, you're still standing.

We're almost there. We're almost there feeling good. All right. Well, I know that your product has changed my life. My mom's, my son's and a lot of my patients, and I feel that it's a very safe and effective one.

I'm just. It always work. No, nothing always works. But again, as far as injecting into people, which is not FDA approved and not self care, I always say no thanks to the other products today, so that should tell you something.

I appreciate your support. Absolutely. So keep it up and we'll talk. Okay. So oh, if they wanted to get in touch with you what would be the best way? Obviously there's camera labs, but if they're interested in Doctor Duncan, Dot Ross at Camera labs.com.

There you go. Duncan Dot Ross at Chimera Labs. All right. Thanks a lot, Duncan. Appreciate it. Thank you for tuning in to Doctor Talks. We hope today's episode has enlightened and inspired you on your path to optimal health.

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