New Frontiers In Healing: Customized Stem Cell Therapy Explained Transcript

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Introduction to the Longevity Summit Guest

Welcome, everybody, to another episode of the Exponential Longevity Summit. I'm your host, Doctor Jeffrey Gladden, and during this summit, of course, we're discussing how we're leveraging AI and other technologies to outlive disease and live young for a lifetime.

And today, I'm joined by a very special guest who's joining us from Buenos Aires, Argentina. It's terra serum of Victoria, and she works with her father.

Doctor Emma Biglia. She's a doctor as well. And, they have developed a really incredible stem cell therapy that they're doing in Buenos Aires. And I first learned about this at Wake Forest when I was there, and talking with some of the clinicians there at the Regenerative center.

And it was fascinating to me to hear about how they're going about organizing stem cells and instructing them to actually repair tissues. So with that, as a brief introduction, I'm thirsty to welcome to the welcome to the show.

Thank you very much, Jeffrey, for having him and for your interested in our work. I think this is a very good tool to to have to work. Yeah. So tell us a little bit.

Tell us a little bit. Yeah. Tell us a little bit about, how this, is different from, you know, people are familiar with Stem cells and peptides and exosomes and maybe some, umbilical and, embryonic stem cell type growth factors and things like that.

But tell us how how this particular, technology that you've developed is different from those things and how it works. So you name a lot of biological tools since part of biological tools.

One of my specialties is being and, you know, noticed the same of my father that I have been working with cell therapy for the last 20 years. Okay.

How Immune Cells Guide Stem Cell Repair

And I remind this about being an immunologist, because the main difference that we have applied in how we use the stem cells is because we combine the stem cells with the immune cells from the body.

Right. We do that because the immune system is known because it has many functions. The better known function is related to this, protection against microorganisms.

But besides the and maybe even more important, it's the function that the immune system has when we need to heal a tissue, when we need to maintain the balance of a tissue, to maintain the structure.

So this is interesting. I'm going to interrupt you for a second. So if you're listening to this here familiar with the immune system basically fighting diseases, looking for malignant cells to destroy, being involved in inflammation if it goes awry, and then being able to resolve inflammation also when it's brought back into balance.

But now we're going to be talking about another function of the immune system besides that sort of going out and finding bad things and killing it. We're talking about another another side of the immune system. So, yeah, if you, observe what happened after an injury in any tissue, there is a significant, one of the healing that comes together with the inflammation.

And the mention has different steps, and each steps has their own function. At the very beginning, the acute inflammation after an injury, it's because the body needs to know that something chronic is happening.

But in a second step and different cells are involved appears another type of inflammation where the immune cells I have, the ones that are in charge to start the process of healing.

They add in cytokines and they generate signals that stimulate the arriving of new cells, stem cells that are going to be less than what we have lost in the injury.

And the immune cells are the ones that generate the stimulus. So the stem cells can differentiate properly. Right. So let me just say let me just rephrase that for the audience.

So watch what you're saying here is that when you have an injury of course you know that it swells. You know that it gets hot, it gets warm, gets tender.

That's inflammation. And that inflammation is being mediated by the immune system. And so that's sort of the first phase of of the immune systems approach.

But there's another phase where the the immune system now says okay let's call for help. So it sends out signaling molecules to basically call in and activate stem cells and other regenerative progenitor cells and other peptides.

Endogenous peptides that we make and things like that, to say, okay, now we need to go in and heal this. And that's that's another part of this that we don't typically think about.

Okay. So what happened after an injury. Our body actively tries to heal the damage. That's right. And the tools our body has is a source of new cells that are arriving and how those cells are conducted by our immune system.

And, it is a very specific segment. It's not that every lymphocytes or immune cells are activated that are just activated. The lymphocytes, the immune cells that have recognized that type of tissue that needs to be healed.

And if I would say this is because this same situation, you can reproduce it in the lab. Take stem cells from any tissue of our body. You can choose which tissue.

And you can take immune cells from the blood. And you can isolate the specific immune cells that are going to actively work in the repairing of the tissue that you want to repair.

Yeah. So this is really interesting. Yeah. This is interesting. Just so the audience understands this. So what you what what she's saying is that there basically been able to replicate what the body's doing.

Absolutely in the lab. So they're able to take stem cells from an individual immune cells from an individual and actually put those together in a way that the immune cells start to recognize the tissue that's damaged.

Let's say it's a cartilage or it's a bone or it's a brain cell. And start to put those elements together. So now outside of the body, you're actually able to start to, recognize and program your stem cells to go back into the body and heal the body at that particular site.

Yeah. In chronic situations where we have chronic them, and if you just use stem cells, they have not enough to achieve the proper healing. So there's no proper direction for those cells.

Right. There's no information. Yeah. You need that specific type of information that of course you in the survival kit phase of the inflammation. Well then it's way if you are facing chronic damage where the team has already tried to cure and was not enough, it generates the sky and it generates the compromise of the function.

What you have to put is new source, new cells that are able to replace the cells that you have lost.

Programming Stem Cells for Chronic Injury

But also you have to treat that their condition, those cells to be able to a simulator in the right place and

differentiate it in the right situation.

That's right. So let me just let me just jump in here again for a quick second. So so what she's saying is that, you know, if you have an old injury, it's kind of gone cold.

It no longer has inflammation associated with it. So if you go in to have a stem cell procedure done, the stem cells do not have the benefit of that local inflammatory response, where the immune cells are instructing them on what to do and what to repair and how to go about it. Right.

So so you're missing a key piece if all you're doing is getting quote unquote stem cells. And so even the addition of exosomes and things like that, they may bolster it to some effect, extent.

But apart from an acute injury where there is that local inflammation present, in a chronic injury, you don't have that information. So this is our technique now to overcome that cold area and actually re instruct the stem cells on what to do when they get there. Yes.

And the thing is this lymphocyte immune cells have a specific moment to function. They are very important in this initial part of the healing. It's like to teach the stem cells when to go and to stimulate the type of differentiation that they need to start.

But the inflammation is very specific. The one that cause these immune cells and then they go away they die. They are not fully once you have the cells place in the right place then remodeling.

Cells that you have there and the process of differentiation and get in and function then takes time for a cell. It's not I think that of course, and depends on each tissue.

That's why you apply the material. And it's very important. The combination of both type of cells, cells in there get assimilated. And then the stem cells that have been differentiated need time to end their development.

And many times you need to build like in stages. It's like like cells. You modify the the territory, the environment, and then you apply cells again and again.

It's like you are rebuilding. It's like. Yeah, rebuilding the house, so to speak. So really what you're saying is that you, you take, stem cells from an individual, from fat, typically, and take them to the lab and grow them up.

So you've got lots of them, and then you basically harvest the person's immune system and you expose it to the, the tissue, let's call it the tissue. It's really the antigens related to the tissue.

But the tissue, let's say for a cartilage or for a spine or something like that. So now the immune system is now activated by those antigens. And now it basically can instruct those stem cells, to, to, if you will, they now know where to go and what to do.

And they, they also what's interesting is that the immune system starts the process of those stem cells actually turning into neurons or conder sites or muscle cells or bone cells or whatever it is you're trying to heal, kidney cells for that matter.

And and then that, that sort of, differentiation leads to those cells actually becoming part of the tissue and then continuing the healing process even after the procedure is done.

And then, of course, you're sort of scaffolding building this back up. So you may need to do the procedure several times to actually get all the way to healing your after. Right.

So certainly because we have to remind you that the stem cells, I'm just pulling cells that have all the genetic information right, but have not decided what to do with it.

They are too late. Yeah. That tissue specific lymphocytes, is an external stimulus to stimulate that activation and then inhibit of specific genes. And we also need to remember that the development of a cell is a sequence where you need to activate genes in a sequence or in activate to others.

And this decides which pathway she's going to take. The thing is when a cell decide which pathway cannot come back. So that is very important. The immune system as one of their functions, has the ability to help this process of developing, of from cells that hasn't chosen yet which type of cells they're going to be.

Right. This is the only stimulus that facilitates the differentiation of the cells. For sure. An environment where the cells are it's very important to end the differentiation.

That's why the treatment is about starting the differentiation process. But the very first steps in the lab and then you apply this is not already differentiated at all just in the first stages.

So they end the differentiation process in the proper environment. What do you need them to be assimilated information. So what she's saying, just so you understand, is that in the lab they can use the immune cells to start the differentiation process in the stem cells.

But if they wait too long before they get those cells into the body, they'll differentiate all the way down to a neuron or conder site, at which point they can't really, you know, instruct anything else to sort of continue to heal.

And so it's important there's kind of a timing element here where, the cells are harvested initially from fat. They're grown up in the lab for a month.

There are then, you bring in the antigens and you bring in the immune system to activate the immune system to activate the stem cells. And then really, you need to get those stem cells started on that differentiation pathway, but not all the way down that pathway before you put them into the body.

So they can actually, know what to do but not be done doing it.

Applications in Spinal Cord and Tissue Repair

That way they can go in and actually facilitate more healing than they could otherwise. And so that's a. Is to differentiate at the moment that you play them in the tissue is more difficult.

That's right. To encase that. Yeah. So every part of them the strategy is because of something. Yes. And because we are talking about using our own cells is that we can use as many as we consider that is necessary and we never going to reject them.

And the thing is, you want to put an important number of cells because there is, Amount of cells you put and what you can spec. But you also need to, be careful about the capacity of assimilation that that tissue has.

That's why many times it seems to divide in different application cells. So you can assimilate them at once by once. And then these become a procedure that is ongoing.

Once you. So she's saying basically that when you do put these activated stem cells in, there's only so many of them that can actually be working on the tissue at once.

So if you have an excess of them then you're kind of oversaturated the situation. So you try to get the right number to kind of repair as much as possible.

Then you put in the right number again to build on top of that, and then the right number of again to build on top of that. So that it's. Really. Yeah. That's what she's talking about.

So so talk to us a little bit about you know, some of the, the conditions you're treating, I think some of the most

dramatic ones that I've, seen and heard are, that have to do with spinal cord injury and even people that have had, you know, spinal cord injuries for a long period of time.

Yes. Tell us a little bit about that. With that, with spinal cord injury, I'm talking about the early 2000 and and Doctor Mulligan, my father was working in, immune system, related with M. S.

and I'm speaking about 90s that there was when the stem cells appeared as a tool and, to use to recover function. And together with the appear this concept about protective immunity.

Then it's about this immune functions that collaborates in the healing. So at that moment he started with spinal cord injury people and saying okay, what happens here is that the injury generated significant loss of tissue.

So let's see what happen if we are able to, apply to the patient new cells in a new environment with these lymphocytes that are able to recognize the damage areas and to guide the new cells to their properties.

So we started with spinal cord injury. But when you damage the nerve tissue it's very difficult to recover from that, especially in chronic, situations and especially when the loss of tissue is severe and significant.

So over the years, we had to learn how to, apply the sense how to combine cells for the spine and cells for the muscles, how to combine the cells with a proper functional stimulation, how wolfman to infuse the cells.

We always use the intra vessel that and delivery of cells because lymphocytes, because the immune system allows you to get through the blood brain barrier and then significant.

And that gives us the possibility to avoid most invasive techniques of cell applications. Okay. During the first year, we worked with nerve tissue spinal cord brain damage and said that very difficult hard work.

But we start seeing change in electrophysiological tests. So then the reaction of the nerves, movements that were absent appear most of recovered of sensitive sensitivity.

So change were happening, maybe not in the quantity that we would like it, but things were changing. So around 2013 with that translating the same knowledge.

Okay. And what happened if instead of taking lymphocytes that recognize that it's from the nerve tissue, we take lymphocytes that recognize antigens from the joint cartilage and then from bone and then from skin, and then we amplify the different shoes.

And we saw that you could repeat the concept that the concept with the set was the same in every tissue. The combination of appropriate lymphocytes with the source catalyst stem cells and pre differentiation give the tissue the possibility to start remodeling and healing and improving the function.

So. So we started with joint then the tendons. And you do see new cartilage. You can see remodeling of the tendon you see in vein of the vascular tissue ability delivery of oxygen.

You do see improvement of the heart line in terms of better contraction cycle one heart or in you can see that. But what is the common factor of every disease?

You start from a disease that is an imbalance in between. It has lost more cells than the ones it's able to replace. Okay. So it could be different causes.

Traumatic. But also it will be it could be because of the aging over time, what you have is that you end up losing more sense that what you are able to replace.

So this strategy is for that tissue to apply to give the potential to recover the financing terms of the cells that it needs to work to function in a good way.

Yeah. No it's quite interesting. I think what she's really talking about is the new kind of technology we talked about earlier in the podcast can now be applied to many different tissues, including the spinal cord.

And interestingly enough because the immune cells are also, part of the solution, these cells can cross the blood brain barrier and go into the spinal cord without having to put them into the spinal cord directly, or into the vehicle space directly necessarily.

You know, I've, I've often wondered, of course, when, when, an injury occurs, certainly in the spinal cord or the heart or any other tissue, we end up with scar tissue and.

And so there are ways to sort of remodel the scar tissue in general. But with the stem cells, like if I think about a spinal cord injury in particular, there's going to be scar tissue that's kind of replaced some of the neurons at that point.

And so if somebody had, say, a crush injury or fall injury and now you're going in with this procedure, does this have the ability to remodel that scar and actually kind of remove the scar tissue as the neurons are coming back?

Scar Remodeling and Functional Recovery

Or do the neurons kind of find a way around the scar tissue? How does that work out? I think that is the combination of both. Okay. Because you keep seeing Scottish, but if you analyze an issue tissue like the muscle loss of head muscles and replaced by a scar tissue. Yes.

So I did the research and you put new cells and you see the development of new muscle. You see that there is the new fibers growing in the proportion of a scar tissue is each time less and less.

Okay. So, so scar tissue is not anesthetic tissue. It's a tissue that continues remodeling and, being able to maintain their right so that lymphocytes, again, the immune system are the ones that are able to get through that scar tissue so the stem cells can get into that area.

And then inevitably, a gentle way it goes is very different than when you, for example, using a certain strategy, you clean this tissue because then what could happen when you do that in the spinal cord is that you can take more than what you want, not just a scar tissue, but also some fibers that is in the midline.

Right. Very good. When you work with cells and let the cells open the space, this phase. That's right. They look like they, learn how to live together and balance and what you see over the years is that the scar tissue is less and less in proportion with the new tissue that is developing.

Yes. This means that we observed in the spinal cord patients that we treat. It's just that are not significant changes in them. I MRI for example. Yes.

You do see signs of connection of nuance and going through up and down the deletion. But there is the, the tissue residuals. Yeah. But I what I interpreted it in terms of how do you explain the functional recovery, the nerve recovery to that is because there is a lot of new communication in between what was left and the new cells that are right.

And new pathways that are alternative to those pathways that you have lost. So I have learned that when you start this process with a patient, it's not about getting the, the dish for the structure as it was before the injury.

You start building a new structure with new tissue. Got it. And one thing that is extremely important in the spinal for patients, but I think it goes to all the tissues, is that function.

And the stimulus that the new cells gets from outside. So it's crucial that if you are going to put cells for example in any, you know, stem cells, you need to locate that need how to lean way to help to restructure the muscles, because that is going to give you a more efficient remodeling.

Right. Exercise what you're what you've seen is that you basically need the external environment to support the healing process too. So if it's a spinal cord individual, you got to get them trying to walk again.

Absolutely fine. So moving them again exactly. Reach them again. And the nervous system learn. Yeah. They have to learn again almost how to walk. Right.

Just like that's why it takes so long. But let me say this. I've been for this, working with this very long time. And it's long. It's sometimes frustrating.

It takes time, but it's worthwhile at the end. It's like you rebuild a new body and you can see a neutral new balance quality of life, if you ask me, does this person is the same as before the injury?

My answer is no, but it's a complete different person. But it means when we start the treatment. Yeah, and it sounds like you, you've been able to restore function.

So if I'm not mistaken, they can people that were paralyzed. Right. And they're now one. Patients that that trauma C4 C5 okay. Like it means it's a low neck damage she's talking about.

So this would be ideal. In terms of strong balance that are able to stand by themselves into genetic steps, by themselves without external help. And I am talking about they start being chronic and complete, patients.

It means long years of very severe damage before we start treating them for sure. And we had the possibility in the recent years to see if you start adding new cells to a, an injury that has more recent, yes, years and it's much severe here.

Yes, yes, much better environment. Right. So I would say as a first step and in any kind of injury, this helps a lot because getting a new source to help them, the healing that's in the situation. Right.

Timing Regenerative Treatment for Best Results

So one of the take home messages if you're listening to this is that if you do have an injury and you are going to do some sort of regenerative technology on it, and maybe you're going to go to Buenos Aires and have this done, think about that.

But if you are going to do something, you should do it as soon as possible, because when the joint is inflamed or when the thing is broken, or when the thing is whatever it is, that's the time that the immune cells are there and know what to do.

And if you drop in your regenerative technology, whether it's stem cells or whatever else, that's the time when you're going to get the optimal benefit.

So there's no point in waiting until the injury is kind of over. Now we'll go see about fixing it. That's actually the wrong strategy. You want to fix it as quickly as possible.

And let me say this. In some cases, if you wait too long, it's too late. That's it. Okay. You lose the opportunity. That's right. So you lose sleep. Yeah. Yes.

Because in that happens in joints many times there is the potential of healing of the joints is very important. But if it's a severe damage where there mechanical errors and friction and into the issue constant damage, even if you put new cells, those cells is going to mechanically damage again.

So one of the things we have learned over the years to do with our patients is okay, maybe there is a joint that we cannot treat because it's late, but what happens with the other ones?

Surgery? Maybe one is the first one to show the disability, but the other ones are in a silent deterioration. And if you

check before and you see this, an MRI, for example, here, there is cartilage lotion, there is condensation occurring, etc., then it's an excellent moment to anticipate in this thing happen with the cognitive functions.

You say if you start treating a patient that already has cognitive disabilities related with age, yeah, you end you can treat them and you can expect improvement.

But we all know that after a certain age, our brain start working in an less efficient way because we start having that problem about we lose more than what we can replace.

So if in a stage when we have function, very good, but we have those sensations. Okay, I could not concentrate as I was before, I can, I need more time on this.

I get some of remember things, but for sure I'm functioning perfect. The thing is, is at that moment you start giving the brain new cells that are able to participate in restoring the balance and also sense to stimulate the development of little vessels.

So you are sure that the delivery of oxygen is well preserved? Then you start seeing that the person there was function. Very good. Can function excellent. Yeah.

And that. That's exciting. The ability that he has when he was 30 or 40 that it happens to all of us. We always remember how with the times that we're having that our youth.

So that is something that we have learned in the recent years. And that's why many times happens that when we have a patients after a certain age in an elective where we propose them, okay, we are going to treat this.

That is damage, like for example, the heart of the joint. Okay. But in a preventive way. Let's also use this tool to help these critical organs like the brain and the vascular tissue.

Yeah. No. That's beautiful. So really the take home message here is that it's always easier to regenerate and rejuvenate when things haven't gone as far downhill.

So you can even do this. You can do it in the acute injury. You can do it after the acute injury on a cold injury. Right. So we're talking about that.

But now we're talking about doing it preemptively when things are starting to slip based on testing that you might do. And we do a lot of testing here at Live Longevity, that gives us preemptive information as to how someone's actually doing with regards to their brain, their heart, their kidneys, etc.

and that's actually the point we think about. Well, we'll just follow that along and see how they go there. They don't need any thing right now, but in actual fact, that's actually the perfect time to actually intervene, because it's never going to be easier to get them back to full function than it is right then.

And I think that's that's a, big take home message here as well. And this, that we are talking about how we can maintain quality of life. That's right.

It's living young for a lifetime. This is what we talk about all the time. If you're going to live young for a lifetime, then you want to. You want to basically be rejuvenating youth, as quickly as you're starting to lose youth.

Preventive Rejuvenation and Supporting Therapies

Not when you've lost function or now that you're, you know, and it's sort of a broken down state. Yeah. So and one thing that I just wanted to say why we use fad extensions from fad being an excellent source because fund is a tissue that we use very little over our lifetime that means that our tissues that are mostly resting.

Yeah. For life. So definitely speaking, those cells are very new. They have reproduced very little times. It's not the

same at certain age. If you take stem cells from your bone marrow, that is a tissue that has been very active.

Seven days a week all your life. That's right. You shouldn't generate new cells. Those cells in in aging measures, more or less than the ones that, had been resting in our fact.

That's right. You know, the thing is, if you because this is something that we have observed in the lab, if you work with a patient that together with the biological treatment with stem cells, that's actively things like also therapy, plasma exchange, exosomes, things that improve the metabolism of this sense, that improve the environment where the cells develop those stem cells, and a much more efficient response that produce intervals of differentiation.

So you can enhance the biological, functions with a lot of external, and helping. Yeah, I think that's a critical point as well. We'll probably end the, the show on that note, but I think, you know, one of the things that we do is like to, we like to prune senescent cells and then basically do plasmapheresis to kind of clear out the trash.

And then at that point, we start to do rejuvenation procedures because you're Olympic swimmers can't swim in a swimming pool that's full of lawn chairs and logs.

Right. You've you've got to clean out the trash before you put the Olympic swimmers in. And now, if the Olympic swimmers are instructed on what to do and how to do it now all of a sudden, right, you're getting you're getting, much faster and much more comprehensive results.

And that's the exciting thing to see that. I have seen the difference. So for sure I understand we are running out of time. Yeah. Thank you. It has been a very pleasant conversation and I enjoy it a lot.

Yeah, yeah. Perfect. And I'm looking forward to coming down to visit you and, Buenos Aires. So we'll do that for sure. Very well. Yeah. Teresita, such a pleasure.

Thank you so much. Thank you. Yeah.