The Immunotherapy Breakthrough Changing Prostate Cancer Care Transcript

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Introduction and Guest Welcome

Welcome, everyone I'm your host, Doctor Geo, where it is. My pleasure. My intention and my purpose to help you optimize your prostate health and even prostate cancer health, which is the topic of the day today.

We welcome Matt Halpert. As you know from the video, you know, Matt, it's such a pleasure to have you on. I think that if I have to, if I get a dollar for every question I get asked around immunocine, I'm not sure that I'll be a millionaire, but I'll be much wealthier than I am now.

So I'm glad you are on the podcast to give us the full spectrum on, your work. Good to hear about your history with the work and and how you help people with all cancers.

But certainly my world, people with, with prostate cancer. So let's start with this. What got you into the work that you're doing? I mean, you know, I, I read some of the papers, I read some of the research, I've had conversations with you. And, who in their right mind would take this route?

Right. The the road less traveled kind of thing. So take us back what got you into this kind of work, and then we'll get into the details. Yeah. Naive person is the answer.

That's how to do this. So. Yeah. No, thank you for having me on. I know we we've done, you know, discussions before, and part of the reason I really wanted to do an updated one is and even just the past year, we've, we've treated a variety of, prostate cancer patients with phenomenal outcomes.

How Dendritic Cell Research Began

And they are just some are just running around the Texas Medical Center screaming about immunizing. So it's it's been very exciting to see. So yeah, I look, I have a doctorate in immunology.

I am not an oncologist. I am not, a medical doctor. I don't pretend to be. And I did not get this degree, or do the study to necessarily work on cancer.

I was focused on the immune system and took that degree, where, you know, over to Baylor College of Medicine, where I spent ten years as an academic researcher.

And, you know, phenomenally long story short, and, you can cut me off because it is kind of a long story, but, you know, my group of immunologists, my research group at, in the Texas Med Center, we were studying dendritic cells.

That was our goal. Our intent was to better understand them. And the reason for that is, you know, the immune system is it's a system. I mean, it is designed to protect us from bacteria and viruses and parasites and this germ that Sherman can't do that very quickly took two courses.

There is a tapestry and it felt incomplete. So I can only imagine moving forward and doing all the extensive research that you have done and in your background.

A it was fascinating on one end and overwhelming on the other. It's. Oh, yeah, certainly can be. And we're still learning a lot. There's still a lot of black boxes.

And so it's complex. It can do a lot of things. And if you have a system like that, something has to be air traffic control. Something has to be the general of this army.

And that happens to be the dendritic cell, which was, you know, discovered in the 1970s by Doctor Ralph Steinman and his group. And, you know, he ultimately won the Nobel Prize for that.

And no one really debates the biological importance of dendritic cells. They they do they run the show. Their job is to see the threat we can call a threat.

Prostate cancer doesn't matter. They're supposed to see it and then organize the complete optimal response against it. But even though they're biologically important clinically, they've been very underwhelming.

We haven't really been able to to use them in very many clinical situations, for a couple of reasons. And so we were focused on that. The dendrite. What are we missing? We know they work.

And you've got groups that have tried to improve their performance by adding, but, you know, a lot of different stimulations or, you know, maybe we can add the flu and get the inactivate this way, or maybe we can stimulate them this way, or maybe we're not maturing them correctly.

Maybe we're not. That's all true. But there's an internal mechanism we're missing because they naturally work. And so what is it that we're missing? And again, just really long story short, because this is a 20 year story at this point we found it.

We we are the ones you know, you can you can know a car can drive from Florida to California and you can get in that car and you can do you can play with the windshield wipers and you can play with the radio, and you can move the seat around and adjust the cup holder.

We turned the key and it turned on. And when we saw that and it wasn't a small change, I'm happy to talk about it. It wasn't a 10% change. I thought it was down a little bit.

Are you referring to cancer specifically? And that just said, no, no, go ahead. No. No I'm not. And it's important I've learned this. I didn't know this when we started.

But there's a lot of cancer clinics out there and I'm using this. Not one of them. We're not a cancer clinic. We are an immunology company that helps cancer patients.

It is really a different perspective. No, we didn't do this to to go after cancer. What we were trying to figure out is, you know, this missing mechanism.

So real brief dendritic cells have two different predominant pathways to recognize the threat. And so dendritic cells recognize we'll just call it and respond to that bus to these two pathways recognize and respond to keep it simple.

Yeah. Yes yes. And we've known and people have tried to use these different pathways. You know with and you can we can focus on cancer, cancer lysate cancer peptides cancer mRNA cancer whatever this pathway that pathway.

And I'm going to make up numbers here. If the immune response it with none of that is one and you load it this way or that way, let's say it jumps up to a three.

Okay. The higher the number people. So we get better, right? The more number a four or a five and yeah, yeah, more immune response, more activity. And so you can add different stimulations or different peptides or whatever.

And you can get it off and fine. 5.5 I mean scientists make careers on this. It's fun. What we discovered is and if you think about it, it makes sense.

Deciding to eliminate cells in your body is a big decision. Deciding to launch a nuclear missile is a big decision. And that's why you always see in the movies there's like two keys you have to turn at the same time.

There are fail safes, and inside the dendritic cell is a fail safe that had not been recognized and still is not mainstream, recognized and essentially it boils down to when it sees a potential threat in one pathway before it activates, before it does anything, it looks to see if it sees the exact same thing in the other pathway.

And this can't be off a little bit. It has to be precise. We've published, as we've shown it is so fine tuned. One minor version, one minor deviation.

It's a fluke. Throws everything dendritic cell is. There's enough a whole the whole thing. We did these experiments where we can change the overlap of one and two by two amino acids.

And the whole thing falls apart. I mean, it is so unbelievably well-regulated. The dendritic cell exerts so much energy with this gigantic complex acting as the failsafe.

Discovering the Dendritic Cell Failsafe

Do I see the threat in the right way when it does? When we did this, you know, we're thinking, oh, maybe we'll get a six or a seven. If you go back to my analogy, we didn't.

We got 10,000. And it's just okay, if it can do 10,000 before we even add any other simulations, why are we all looking at four and five and six as anything other than background noise, which is kind of what it is?

And why haven't you got to do this kind of work? Man, no wonder, did anyone know you? So you're you're the first. No, no. Others would claim that. No, we've done this work before. It's just. No, I see.

No, we have a variety of patents on this. They're they're. I mean, this is ours. We we've published this. We've got grants on this. We started a US venture, design.

So back up to when we discovered this, we back up as immunologists, as scientists, and we realize the potential importance. We realize. No one's actually used dendritic cells correctly in the lab before.

And so, I'm not in the laboratory, in the clinic, let alone in the confines of cancer. But, look, this could also be for viral infections or other things.

We we we don't know which. It's a targeting platform. It's a way to properly activate your dendritic cells so that they see the threat correctly. When we realize that it we didn't even start with cancer.

We were targeting other things just to kind of prove we could. And we're eliminating this and that. And it just is what it is. It's like, all right, well, this is how you do it.

It's step one in a physiological immune response. And of course, at some point it clicks on, could this work for cancer. So we do all those tests. We do all these these experiments, these model systems.

And we're seeing results that we're being told, you know, it's not possible. I thought for a second, just for context. Right. So the audience so people that I counsel, they they know a lot about natural killer cells and cancer or they've heard this connection before.

They heard a lot about T lymphocytes and importance of that. Can you take a step back for a second and break that down for us? Like where are these dendritic cells and are they the same as the natural killer cells or are they completely different.

Each one does a different job. Yeah, sure. Happy to know they're they're definitely different. So like like I was saying there's there's an immune system army in your body.

Natural killer cells and, cytotoxic T lymphocytes, for example. Those are examples of foot soldiers. Those are cells that are actually going to go find the cancer and kill it.

And interestingly, NK cells and these T cells, these killer T cells work complementary. So when a cancer is very targetable by one it's less targetable by the other and vice versa.

Just to show how meticulous our immune system really is when it works together. So those are absolutely the right cells. You want activated and fighting the cancer. But where are they getting their information from?

Where are they getting the knowledge of what they're supposed to be attacking and how? That's the dendritic cell. Without that, they're just circulating in your body, and maybe they stumble upon it and maybe they try and do something, but maybe not.

And for a lot of cancer. So they're they're not. But dendritic cells are the signals and so is everyone else. All right guys you catch the bad guy. Go get them.

Exactly. That's exactly when when the the dendritic cell goes to the lymph node and it starts talking to the immune system. The other the T cells wake up, those T cells wake up and they start proliferating, which is what causes the lymph node swelling.

And then you know it's going to go to work and, you know, do its job. Finally, and if you can't get the dendritic cells to work, which has been an issue, there are other ways you can try and stimulate and activate NK cells and maybe we can genetically modified T cells.

Hence car T, they're not physiologic. You have to accept that you are skipping the dendritic cell. You are skipping step one. So you just have to accept you're playing with half a deck.

It doesn't mean you can't win. It doesn't mean there's no benefit. But there's no way to say that's physiological or natural because no, the natural where are these cells around the dendritic cell to communicate to the cells what to do.

So going to predict self. Yeah. So the which cells dendritic cells. Yep. So they're kind of typically they're you know going to be spread out around your body as sentinels usually really in tissue.

They're not really in circulation. If anyone is really claiming that they're going to pull dendritic cells directly out of your bloodstream, right. They're red flags, but somebody is claiming incorrectly, right.

So you can. Yeah. Yeah. What you can do and what we do and what you kind of have to do, because you're not going to remove chunks of tissue out of a person is you can get acidic precursors, the cells that will become dendritic cells.

And you can differentiate those in the lab to be dendritic cells. But you're not going to pull them out of blood on their own. Very angry because that's not where they reside.

They're more thanks for for that clarification. I think even for me, honestly, there's a probably the area of it, in immunology where I probably know the least.

So this is why I'm so excited to have you have you on. So I feel like I'm a student just like anyone else here. So thanks for clarifying that. Oh, absolutely.

I love to to talk about it. Obviously there's a passion. So I mean, we just we basically discovered this what amounts to a physiological targeting platform.

And it's on. And the questions that are well what can we target. And in theory anything we can properly double load into these dendritic cells. Again that's a term we made up because we had to make way to call it something.

We have patents, we have it is ours. And we're we're moving it towards cancer. Now to prove. Look, I just told you the field is rife with failures for dendritic cells to help prove that this is genuinely different and unique.

The first clinical trials that we have been working with or pushing forward via the FDA route, we picked very tough cancers where we did not decide to hide and say, we'll find out in 20 years if this actually moves the needle.

We picked a very aggressive form of glioblastoma, which in and of itself is an aggressive brain cancer. But then there's a subcategory that's even more untreatable.

We've picked pancreatic ductal carcinoma, that's ongoing. And then we're coming up on a third, which will be refractory melanoma, meaning melanoma patients that have stopped responding to treatment.

What I can tell you without getting too into the weeds is that, both are most advanced indications. Glioblastoma and pdac have been fast tracked by the FDA.

Not because they just like us, but because the science and the results say there's something very real here. Let's move a little quicker. We've won a Breakthrough in cancer award a couple of years in a row.

We and I can tell you now, the phase one for the glioblastoma finished with no attributable severe adverse events, nothing dangerous. And a very, very significant moving of the needle.

What does that mean? Well, let's remember, it's cancer. Let's remember that. Let's be fair to this is a very aggressive, basically untreatable cancer, depending on who you talk to for un methylated mgmt.

I'd wildtype GBM. The needle hasn't moved ever. Some might say it moved 30 years ago. I mean, it really hasn't moved. You have a median survival of about seven and a half months.

Meaning if we can push that for cancer treatment ten months, it's a huge win. That's how cancer. That's how it works. You know? Yeah. And I can tell you that in one of the cohorts with three different cohorts and one of them, they're now thinking 45% of that cohort may be long term survivors.

Because, you know, we're not at seven and a half months, we're now past three years for the furthest along. And it's not one patient. It's multiple still going.

They still have no evidence of disease. They seem to be fine. It's not a small. And what do we do. Three shot three three shots of double loaded dendritic cells.

And that was it. Could we have done more. Maybe the trial was designed to do three and see what that what benefit came from that. And I can tell you that's a pretty impressive first swing of the bat.

Do we cure 100% now. And that never happened with I mean, prostate cancer. And the way I frame it to fund the advanced prostate cancer patients is once the cat is out of the box, what you want to hope for is that you manage it really well for a long time, while sustaining good quality of life.

That's always my goal, with with such patients and even, you know, and they tend to, you know, prostate cancer even advance is not you know, it's much different than glioblastoma or melanoma or those kinds of stage for any research that and sorry.

Go ahead. We just and we can talk about. Yeah.

Natural Killer Cells, T Cells, and Dendritic Cells

Well you know for Earth first of all I can say we can show prostate cancer we've got because do something in something that to some degree, you know, ten prostate cancer cases are all different.

There's a but the advanced stage four that's metastasized, right relative to stage four of other cancers. There's some nuances that are different, but not as much.

So two questions. Number one, have you've done this kind of research on stage four prostate cancer. Is there a cohort of these guys there as well. Number two, I know I've I've sent you patients.

So tell me what you know about using immuno seen for prostate cancer. No. Yeah. Yeah. So yeah we absolutely have decent treated a decent cohort of, of stage four, prostate cancer patients at this point.

Another note, they don't all have to be stage four. There are opportunities where it might make sense to treat sooner. Actually, we're going to get going. We're going to get into that in a minute.

The cat back in the the bag, so to speak, before things get, but, I'll tell you now, for example, it's not a clinical trial. We we have to be diligent and careful with what the trials are because they're honestly, they're expensive, and they take a lot of work.

And, you know, we're not huge. We're not we're not Merck. We're not Pfizer, right? We're from a toddler. But at immuno seen, which we started after a three year trek to try and figure out how to ethically, legally and with scientific integrity offer this to patients today.

Because nothing I've told you about the discovery is about pancreatic or GBM or what the target is or what the mutation is. It's about getting a sample of it and properly double loading your dendritic cells.

Why can't this work for prostate or or breast or sarcoma like the answer is it it kind of it can. And so I'll give you three cases that I like to highlight right now for prostate cancer.

One, I have to give a shout to the very first patient we ever treated. Because this was a case of castration resistant metastatic prostate cancer with about 40 lesions in a patient who at that time could not walk and was in hospice.

This was in 2017, before we were in concurrent. So just a long time ago. And this is a gentleman who saw our science. He wanted this. He said, it's going to help me. I want it.

And we said, we don't think it's going to help you. We said, we we're being honest and ethical here. You're pretty advanced. It's not good. We really don't want you to waste your money or travel around to do this.

And he just flat out ignored us and then flew to where we could do this within legal parameters and called us up. And it's like, I'm here. You should. I mean, it was so ridiculous.

And we said, fine, like, we just whatever. That's 2017. I talked to this gentleman two weeks ago. I mean, he was right. He is still here. And, you know, his kids were 12 and nine, and now they're I mean, we fest we're in the future now.

And so right away, we, the scientists have underestimated the potential power of getting your immune system properly engaged. And so there's, you know, earlier that we've actually had the chance in the past year to treat a couple of, people from the Texas Medical Center, kind of some higher ups.

I won't mention names, but like a professor at Baylor, a board member, that have prostate cancer. So one of them, also, you know, castration resistant, metastatic proteins.

There's actually a, doctor, a surgeon who works, with prostate cancer patients. It's very interesting. It's very interesting story. And of course, he knew about us in local to the the whole chapter in Houston here.

And it's it's coming back as PSA was about 140, I think he had previously preserved some tissue for us, which was critical. We treated him. All I can tell you is that no one told them, hey, after the third round, dendritic cells go home and do a PSA scan and get your PSA.

I don't know why he did. That was very quick and I don't want to mislead. Doesn't always work that way. But his PSA was point seven and his PSA was based.

And was it only where there are other variable, you know. And this caused quite a stir. Is he doing numerically was obviously even if he was on ADT that would not work because it's castrate resistant.

So anything else. No. No docetaxel. No no for him. No no not for him at that time. This was his shot. We were going to continue working with him to advise some potential other things, but we're not really sure what to to do at that point because, well, if it's all gone, I'll tell you that he, he's.

Because he is a academic. He's actually writing his own case report up. And, it has become a very big proponent of this because for him, it did work that amazingly, we have another, similar case.

He had four lesions throughout his bones. About three months after this treatment, three of those lesions are gone. One of the lesions is down to about 10%.

You know, we'll see. I mean, we're not quite there yet, but that's it's hard to look at that when all they've done is add this. This is a gentleman that had been on ADT at that point for a while for I want to say even a couple of years.

And this was obviously a, he wanted to add this and all of a sudden it went from kind of slow progression to, oh, it's going away. And absolutely ADT and other, modalities can be synergistic with this.

We're not necessarily saying you can only do this, but why wouldn't you want to get your immune system actually targeting and fighting the cancer. And if it works together to where then all your lesions are gone.

What could you find? You better appease would be. And that's what we want to want to do. And, you know, obviously there's so many things you can look at from a research and objective perspective.

I'm okay with, let's look outside of the box here a little bit. That patient for lesions, any benefit for him to treat it with radiation. So those four lesions locally and then do immunostaining or vice versa or just do a Munising first and see what happens.

And then if there's another lesion there then you can hit that with radiation. What have you seen. Yeah. So there's a desire amongst a lot of our candidates, our inbound leads to I hope all they all like I just want to do just them you know, seeing just that nothing else.

And sometimes that's fine. But a lot of times we are going to look for the other opportunities. The goal is to get you to a point where this cancer situation is, but, distant chapter in your life.

We're not looking for a two month band we're looking for.

From Lab Discovery to Cancer Trials

You're going to live another 50 years. How do we get you there? And if you have immunological memory, you have a much better shot of what I would call true, complete remission.

Not just. Right. Well, we couldn't see it by scan, which it's not the same mean there's no cancer. So couple things we've seen, and I'll be specific to prostate cancer.

So, if it makes sense. And of course, this is case by case, but absolutely ADT is can be synergistic with this. We do need a therapeutic window. We need time.

This is not magic. It will not just because we start this. Just because you're approved for treatment doesn't mean the cancer says well I give up, I'm done.

It's going to take a couple weeks to do this, maybe a couple of weeks to do that. I mean, we want your therapeutic window to be as long as possible. And admittedly, the the slower the is growing, the more likely the odds, which is what we're dealing with in cancer, the more likely the odds the immune system will be able to round it up and

eliminate it.

We don't want a patient to have to be on ADT the rest of their life. The goal is let's get to a point of need, no evidence of disease. And then slowly we wean you off that and make sure things look reasonable.

So very often we'll have patients who we will recommend continued. It's always continued. Right. Stay on your ADT but come do this as far as you know as well as I do prostate cancer.

It does like to go to the bones. And we absolutely see episcopal effects with immune responsive lesions in the bones. I just told you about the gentleman from 2017.

Most of those lesions were bone. So we know that we can take a sample of your tumor somewhere from the prostate or maybe another Matt. And we're going to get a systemic immune response that is going to find those lesions.

With that said, sometimes lesions in bones, it is more protected. It is a different environment. They may have mutated some to get into the bone. And while that doesn't mean they're necessarily invisible to the immune response, it could be they could be tougher.

So depending on where those lesions are, we may recommend focal radiation, especially if there's concern of spinal fracture. For example, if you've got a lesion growing in your spine, we've got to you've got to deal with that.

I mean, before we induce an immune response, which kind of could require swelling, which could be dangerous if you're got a lesion in a bad spot, we're going to say do radiation, prophylactically before doing this treatment.

I think I prefer the patients that are able to withstand it. It's got to make sense. Oncological. But yes, if you can do a prophylactic round of radiation on some of the tougher looking or more aggressive spots before doing which, would there be more immune activity in an area that's been radiated?

Other patient area is abnormal to the body. And is that an official or harmful? Yeah, almost certainly. So something that is starting to come out and I'm speaking as a scientist now, not, not a medical doctor here, but there they are showing that low dose radiation can be very synergistic with immunotherapy.

Because rather than blitz the whole area, it, it causes a different type of cell that that actually will lead to a lot of energetic expression and dangerous signal release and make it very, or more prone to the immune system.

I theorize that if we had 100 patients and 50 did this, you know, pre pre immunotherapy, low dose radiation versus 50 that did it, I bet the ones that do the radiation would see a better outcome as an average.

Where we're going to recommend you got to blitz that area is for dangerous lesions in the bones where swelling could lead to some severe pain or fracture or things like that.

You have to you don't. You just got to knock out for other lesions a little bit more doctor patient choice if they want to do that point. The only key there is to remember we cannot make your immunotherapy without a sample from your cancer.

So if you have three lesions and you irradiate all of them so they're dead. Now we have missed the window. We can now not get a sample to create your product.

So you need to time it right where. Let's make sure we get that sample first. Then maybe you do this radiation and then you come back for treatment. And if those things work together to where your cancer free, take us through that process for a month.

So you've mentioned several habits, which is a key part apparently. Right. If you cannot find a tumor lesion in the body, all bets are off. You need to get a sample of that through a biopsy to then do what you do.

So take us through that process. What is the patient experience? What is the process. What does that look like for the for for the patient. Yeah. This is as personalized as it can be.

Part of the reason it is always going to be kind of expensive is, there's really no way to make this off the shelf or even scale it so simplistically.

If I'm if we're making my, God forbid, my prostate cancer cells. So will not help you guys. Yeah. If you can get a tumor, if you could get tumor tissue from one patient, that doesn't mean that will help you.

Also with. You know, maybe there might be some overlap, but it's not something we've explored. And as you said, and I've pointed this out to, if you take ten stage four prostate cancer patients, they're all different at that point because the cancer where to be clear, that's where it's going.

You don't that these are just another. And so because it's so important you're a patient. Patient clearly has a recurrence of prostate cancer. But he had prostatectomy.

And you can't really find either from a PSA may scan where the cancer is or it's in a lymph node somewhere where it's very difficult to get. What is that scenario like?

How do you get tissue from a difficult patient where difficult? Not the patient, but where it's difficult to find tumors that you can extract. And, yeah.

Well, let me answer all your questions kind of in one, one swing here. Right. So, you know, something we do with immuno seniors is we really kind of wait till the tail end to actually ask patients for money.

You know, if it's about a week before you're coming, you've been approved. You agreed to come. You can't. You need to pay. And we could talk about that, but we don't charge to do a review of a patient case, and you can't be approved without that review.

We need to look at your oncology notes or labs and your scans. That's going to tell us those scans especially. You're going to tell us, do we see a lesion we think is accessible by biopsy safely.

And do we think we'll get at least 250mg of cancer sample. You know, it's a pencil eraser amount. It's not a lot. It doesn't have to be the primary. It doesn't have to be from the prostate.

We absolutely have sample from lymph nodes and and metastatic lesions. And that's worked just fine. So we're looking for the really least invasive locations.

Prostate Cancer Cases and Treatment Results

Sometimes if there's a couple really hot spots we may sample multiple. So if a patient wants to come to me and they say, I think it seems a great fit, I want my immune system, I want to put Michael Jordan in.

I mean, let's do it. We're going to do you're going to reach out to us, you're going to apply on our site. Takes a minute. It's not hard. And our patient coordinators are going to reach out to you pretty promptly to start setting up the introduction.

A phone call. Let's make sure we, we have a baseline understanding of who and what I'm noticing is. And then we're going to need those records. You need to get us your records.

We need to do a review that's going to include our oncology team, our interventional radiology team. It's not me. It's our medical team that's that knows what they're looking for.

Right? If we do not see a lesion that we think we can access safely, we really can't approve you. There's no way to make your treatment. And we can talk about some ways around that.

Maybe you had some tissue cryo preserved in the past. Okay, that we could use that. But if it's just your signatera went up or something, or your PSA went up, but there's no obvious lesion.

No, there's nothing for us to grab to make for you. Sometimes it could be too dangerous. You said hard. Maybe it's too dangerous or unlikely to be successful as a biopsy, but a surgery would do it.

We're not really necessarily always offering to do those surgeries. And can we ten sometimes we do. And that will be done in an internationally certified private hospital.

But ideally you have a an opportunity at home where a surgeon says, I know, pull that out and make sure that's not the tissue biopsy, from the prostate itself.

If there's probably issues with any lab, any, clinical facility offering that to you. But let's just say they would would that help? Probably not. So once the tissue is fixed for pathology, it's got paraffin aldehyde, formalin, paraffin.

It's I say there's a critical component we need that it's likely been degraded and and unfortunately 95% of I mean I think this is a failure of, of mainstream just my own pedestal is is most tissue is not preserved in a way to maintain RNA integrity.

It's may it's only maintained for pathology, for histology. For that thank for those analysis. The tissue needs to be flash frozen, not frozen flat frozen, you know, dropped in a liquid nitrogen container.

Or it needs to have something added like RNA later to preserve that integrity. And then it needs to be stored, you know, in liquid nitrogen or or at least -80°C.

Just taking a, a block from the pathology lab that wasn't properly flash frozen or cryo preserved and saying, well, we put it in the freezer. All right.

So you are able to get, you're able to get a biopsy tissue tumor. And so in that scenario, you. Yeah. And I'm going to do a quick plug. You reminded me. So thank you.

We do get a lot of patients that are calling us too late. They are calling us or saying look I know the cancer is probably going to come back, but I'm in good shape now.

I want to do this treatment. And honestly, it's a great time to do it. But they've got no tissue. They didn't save tissue. So what immunizing has done is created a Munising preserve.

So you can go look check it out a Munising preserve.com where we are trying to get ahead of this. We have created a pretty simple kit. We will you have to fit it you know do some steps but we will send you a kit with a tube with tubes of proper preservative for this.

And if you have a willing doctor at a willing institution, to take some of your tumor material from a surgery or a biopsy and put it in those tubes, and you send it back to us, we got it.

We can use that later to make your vaccine at the right time. You just have to think ahead. So we could talk more about that. But we are trying to actually help patients think ahead and save some material correctly so we can keep this option on the table.

So let's say though you apply you are a good candidate for Munising. You do have an accessible lesion. We're then going to set up a final due diligence call with you and our scientific and medical teams to make sure you, the patient, have gotten your questions answered. You know who we are.

You know what we're doing. And provided you want to proceed, our average lead time is 3 to 5 weeks. Sometimes we can get someone in a little quicker, some.

And if it's going to be much longer, longer? You know, if the patient says, I don't want to do this for six months, it's fine. We're going to need a new review, though.

We're not going to approve you in six months. Based on a historical review. Things change. Cancer, as you know, can change very quickly. So we need to see that.

But if you want to proceed, we'll say, great, here's your start date. We'll give you some options. You'll pick a date in three weeks. Our Cancun concierge will reach out to you to start talking about where to stay and how we're going to collaborate and communicate to to build your schedule.

We have a driver for you. You know, we'll pick you up at the airport. We're going to take it all your medical appointments. You need to be in Cancun for the first week, because we're going to do a baseline scan, baseline labs baseline.

We do our own. We have our own flow cytometry core. We're going to we will show you that we major dendritic cells correctly. We will show you how your immune system is responding to the standard cells, if you want, in a raw data way that like an immunologist would look at, we have that data is important for you continuing that path, because that's actually very important, like people want and would like to know, like what does this look like. Right. What is that process look like from a clinical and scientific perspective?

Take the tissue. What happens to that tissue. What do you do with it. How do you activate these dendritic cells from that tumor tumor tissue. What's the science behind that in a in a in simple language.

Yep. So yep. So we take a sample of your cancer. We do that like I said that'll be a biopsy. Done right there. And taken in the internationally certified private hospital.

Just it's it's a procedure. It's usually outpatient. If there's any concern, we'll keep you overnight, but it's usually a patient. We now have your tumor material that goes to our ISO seven certified clean room lab right there with our scientific team.

Also during that first week, you're going to get 4 or 5 days of Nugent. G CSF. We need those white blood cells to go up up up up up. Because then we're going to do either an A for Recist process or a large peripheral blood draw depending on safety.

But we need to get those white blood cells. I just said I said earlier we can't we're not pulling dendritic cells out there. Not really any there. But we're going to get those precursors that goes to the lab in the second week.

You don't have to stay in Cancun if you do not want to. We're in the lab doing the heavy lifting. And so what's going to happen is your precursor cells are carefully going to be differentiated.

And how does that happen. That's because is that two more guys. And this is the same protocol. Your lab that this is a big tumor is making these cells signal correctly.

Yeah. And you we have no we have to there's two different pathways happening at the same time. So one is taking your immune precursors and pushing them down the path to be dendritic cells.

How do we do that. We use specific cytokines or signals that your body normally makes in, in, in vivo to, to promote this to happen this the way we push this is not really that part's not really unique to immuno seen.

This has been known for decades how to create I mean, the way you study dendritic cells in the lab is you same thing. You have to make them, because you're really not going to just be able to go get them.

So that's a little ho hum. But you need to do it right. And I will tell you, this is something I've learned. I did not know this. There's a lot of groups out there that do claim to make dendritic cells or whatever.

I can tell you this. Someone who was a was and is a scientist, but in the lab, if you want an experiment to work right, you buy the expensive reagents from the top line company.

If you don't really care, you're just kind of playing around. You can buy cheaper stuff. It does make a difference. Yes, cheaper stuff is cheaper, but I can tell you that the dendritic cells that evolve from that are very inferior.

And I just, I it baffles me that when you're dealing with someone's life, that doesn't seem like the area where you should cut corners. And so I've, I've heard other groups and, and kind of seen what they do.

We don't we treat this like a biotech basically. And so we, we do get the expensive stuff. We make your dendritic cells. Now what else are we doing. We've got your tumor.

What do we do with that. Well, we have to break it down to its entire genetic signature so that we can isolate what's called the messenger RNA. No, this is not an mRNA vaccine.

Unfortunately, due to politics and other polarizations, people have no idea what that means anymore. No, we're not injecting mRNA into a patient. We're certainly not injecting foreign mRNA into a patient, which is, you know, what people have, you need to.

So we got to get separate of that. But this, this from the tumor, this RNA signature is what is what the cancer is and or wants to be. We need that. And we actually have to amplify it to make sure we have enough to make a therapeutic amount.

All this stuff is part of our, our our patented and very unique process. We also need to make an entire cancer library of all the proteins. Are we cherry picking?

Are we going to say these are our ten favorite antigens and that's what we're going to target? No we're not. The more you narrow that down, the more likely it is for the cancer to ultimately escape.

If it can learn what three things are being targeted, it can stop producing those.

Biopsy, Tissue Preservation, and Patient Intake

And now it's invisible again. We take all that information and now we go back to the science. We take your dendritic cells and this will sound simplistic, but it is meticulous.

We're going to double load them. That information needs to be in these two pathways exactly, precisely at the same time, in the same way. And when that happens it you can almost see them wake up and say, oh, that's a threat.

They're now ready to go. And so that is what ultimately after we do the right QC and make sure things look good, that's what's going to be administered to the patient.

And importantly, it's going to be administered near draining functional lymph nodes. Dendritic cells should not be going. I just told you they're not in the blood.

Why does anyone out there do dendritic cell infusions into the bloodstream? They do not migrate. Well, from there they get stuck. It is not the right move.

It also is a great immunologically to say you have brain cancer. Let's inject this in your foot. No, it actually is beneficial to be proximal to big lesions.

And so our interventional radiologist will use image guided, you know image guidance to target non compromised training lymph nodes and inject these cells right next to them and enter them.

You don't want to mess with the lymph node in the lymphatic. That's right here in another node. That is actually a really important component. Right next to a lymph node.

So we don't need you actually you remember dendritic cells. What would they do in the body. Normally they would migrate through the tissue to getting the lymph.

We kind of want to simulate that. But it's not going to happen at this juncture if you just inject them in the blood. So we we put them in the tissue next to the node and we let them finish migration and maturing, because that's a natural response.

When they get to lymph node, they then they didn't show up there because someone squirted them in, which is not normal. They did it. The natural way. And so what does your body see?

Your body sees what it should have seen on day one. Oh, here's a dendritic cell with some information that's critical to our protection and our survival.

We better get the immune response going. And the dendritic cells now going to communicate not just the target information, but it's going to give all those signals.

It should have the ones we've learned and know about, the ones we still don't because we have it's 2025 I assume will know things in 2055 that we don't know today.

And so let's let the ten good Excel do its job. This is what's going to lead to lymph nodes. Swelling is the proliferation of those those NK cells those T cells as effector cells.

And they're now going to go search the body for this signature. Where are these cells. And everywhere they are. And what patients who will say if you have a patient with a lesion in the rib and the hip, they'll tell you, I see I can feel it in the rib.

In the hip. What do you think you're feeling? You're feeling the immune attack. Does that guarantee today you've won and the cancer's gone. Now we don't want to mislead.

It's still a fight, but your immune system is clearly targeting it. You're not saying you're feeling it in every rib. And no, you're feeling it where the cancer is.

Hooray! Now keep going. Let's keep pushing this immune response. Let's keep strengthening it. Let's do what we can to keep the cancer down. If there are options, we we need time for this to work.

But yeah, at the end, if you come out of it and your lesions are gone or they're just scar tissue at that point because the immune system gobbles it up like it should have, you win.

I mean, move on. And maybe you didn't have to surgically remove your prostate or there's a variety. Right? There's a lot. Right? I don't know any other types of prostate cancers.

I guess it would depend. So if I had to summarize right what that process looks like. So you find the tumor, the tissue, you find a tumor in the tissue that you have to biopsy.

You take that tumor, you do what you do with it in the lab. I guess that those details are less important certainly to me and the people in the audience.

But there's some sort of, immune response there based. And you could, based on the, what you do in a lab, there's probably proprietary sort of information, I guess, as well.

And then you're inject that that solution. I don't know if I'm using the right terminology in the lymphatic node or, or in the lymphatic node near the suspicious area where there's a lot of tumor activity in the body.

What did I butcher there. And clean that up if you have to. Yeah. Yeah. That was very close. I mean, yes, you're absolutely right. We need tumor tissue, which we will confirm is cancerous by, you know, some pathology.

And, and, we need your immune precursors. And so, of course, if you don't have them in precursors or, you know, that's another no go, right. But, what we do and this is one of those things where you're right, what we do in the lab, in a sense, is not so important to you as the patient.

Right? You're focused on the end goal, the end product. What we're trying to get across, though, is what we do in the lab is the mat is the secret sauce is what sets us apart, is what is so unique here.

Because if you don't know that, if you say, oh, okay, dendritic cells, there's another group that does dendritic cells to normality, right. No you can't do a dendritic cell therapy by now.

Like that doesn't make sense to a an immunologist or a scientist. So we need people to recognize that that is specialized and critical. But no, they don't have to know every step or suddenly they have to have a doctorate. And like of course, time.

And then yes, we give you those dendritic cells back near relevant areas and we'll normally do about three doses. So if we're at the end of week, the first week we got to get all the material.

Second week we're building your vaccine. If everything still looks good, safe, not medically reckless, you're going to get your first dendritic cells administered at the end of week two, and then again at the end of week four, and again at than a week six.

Why the two week breaks? Because that's how the immune system works. The right way to give those boosts is at that time point. Business wise, it'd be much easier to just give people three doses in one week.

It just doesn't. But that doesn't make biological sense. And so we don't do it that way. What are you doing between injections one, two and three? Go home.

I mean, look, you can stay in Cancun or worse places to be, but you don't have to. You can go home. It's an immune response, right? You're going to have immune symptoms if you have symptoms.

A lot of prostate cancer patients, if they don't have bone disease, have have had really minimal symptoms. And then if we have more dendritic cells, we'll hold on to them.

We'll cryo preserve them for future boosts. And then collaboratively because when you're at the end of the third, you know, and we're going to do another scan and we're going to do more.

We do liquid biopsies to analyze. We do labs. We do. I mean, we're going to get a lot of data. You as the patient are free to ghost us, but we're not ghosting you.

We have a whole follow up medical team. You're going to stay in touch with us. We're going to keep reviewing your data, your labs. We have oncology advisors who are going to continue to be aware of your case and can help.

We can not replace primary care. There is no ethical way to do that. You're back in Minnesota or New York or Florida. You're not in Cancun. So we can't ethically be your primary care.

But we're still here to offer advice and opinions, and you can come back. And if the team if it makes it collaborative, are you going to have access to them forever?

We're still learning. Once you have that first number and that solution, is it available for how long? You just in case there's a recurrence or. Well.

So right. So let's say we have three outlook lots of boosts I mean you've got three. So if you use a three no we

would have to start over to make a new vaccine later.

The way we store them, we we have validated that they are good for at least two years. The way they are stored would suggest they should remain viable for, in theory, kind of indefinitely.

The longer you go, you know, the viability will always drop.

How the Personalized Vaccine Is Made

So it goes from 100% to 95% to 90%. But since we don't actually know a magical dose number yet, what if there's only 50%, right. That might be just as good.

Like we don't know. So we don't know. So they would it would last a really long time. I can't tell you longer than we know, because we're not that old of a company or a group, but it it should last.

What? What's happening? As it relates to thinking and. Yeah, if you need it, there's a lot of people listening to this, and this is great. Where do I sign up?

And obviously, a lot of people cannot go to you because they don't have the resources to go to Cancun. What do you foresee will happen so that this type of treatment, can be available to, to more people?

Do you see that as a possibility, or do you think you're going to just stay in Cancun for the rest of your life and just work from there? Yeah, I mean, again, we didn't start this with the thought of opening something in Mexico that wasn't the plan.

Honestly, the plan was to, to license this, but we just couldn't find who we really trusted. And we don't want to jeopardize everything we're doing stateside.

So it's a little tricky to to tell you this. So, you know, we're doing trials. I just told you, and we may get FDA approved. But remember, if we get FDA approved for glioblastoma, that doesn't mean it's FDA approved for prostate.

That's just not how it works. And so if it's FDA approved for cancer, you have the option or the likelihood of insurance reimbursement, which is great.

Let's level set cell therapy for cancer. The going rate right now is 400 to $600,000. That's the price point. So yeah, you're going to really need insurance if you want this in the States at that point.

And honestly this could be within a couple of years. Now it could the I told you look we lost almost we're in the phase 2/3. It's already open tons of great institutions on board.

We may be looking at an approval here in the near future. Can you go to you know you and and clinic and say I understand it's for that I want it off label.

You could but insurance isn't going to cover it. So you're going to have to come up with a lot of money. Well, it's still expensive in Cancun. It's not that it's not $500,000 expensive.

It's, you know, a fifth of that, you know, between a fifth and I'm sure. Right. So it is a lot. So then you do it in case you happen because it's just less expensive to do it there relative to all the procedure.

If you have to do it in the US, off label. Plus they'll come after you a little bit more in the US, wouldn't they? I mean, it's just be a nightmare probably.

Right. Is I don't know. It is honestly something I just have not fully explored because I just envision it's going to be very challenging. And in the end, it's going to be extremely expensive, and we're going to run the risk of conflicting

with ourselves and conflicting with the FDA.

And so it's just at the moment, I'm not telling you this is staying in Cancun. We're looking at some other locations, other groups are interested in maybe do it because they've seen they have patients.

I've seen data. They say we want this in, you know, we want this in Abu Dhabi. I mean, there's actually some interesting things there, you know. Is it are we anywhere near where this is going to be cheap and easy to get at home?

You know, home being the United States right now. And the reality is because it's always going to be personalized. It's not a drug. It's just not something that's going to be $0.10 to make.

We think you've got to cover the cost of a biopsy of all those labs of the afarensis, of the central line of the, you know, if we're doing anything else, liquid biopsies or other things to get data, there's a lot of doctors, a lot of specialists, a lot of scientists, a lot of equipment and reagents of manufacturing the vaccine in the lab.

This, this product, QC, you know, let's let's not forget, you know, scans and things like that. You always need to have someone actually read the data.

People are often surprised at that costs more in mainstream. You've got all these reports you have, what about medications? The new pigeon or or what about if there's a side effect or something?

You know, symptom management? We offer concierge coordination drivers. It's actually a pretty large list of what is covered by. For us, we just do the one time fee model where it's this is it.

You know what you're paying you, this is what you're paying. There are no more bills. If you need an extra visit with the down colleges, so be it. If we need to run extra labs, Soviet.

If we need to do this, so be it. You're not roughly. It's about what it's like $90,700. More or less or higher. 120 so when you look at it from the perspective, it's 120.

Play a little devil's advocate, but at the same time, one cancer care in the US is astronomical, is weight is more than that. So obviously most people don't even make a lot of people don't even make 120 a year there.

Those that do under 50. Again, on the flip side, it's very expensive. Cancer care is very expensive. So, I tell you what, a lot of the patients that I've seen have gone to.

You guys have been incredibly satisfied. I can't say yet that they've been cured because they have. You haven't seen them long enough. They haven't been on and doing the treatment long enough to really know, but they've been satisfied.

The care has been extraordinary. And, you know, they've had no regrets. And their and their cancers seem to be managed. It's better managed, quality of life, even has it has improved.

So pretty, pretty impressive. I've, Yeah. There's. So I'll get. Let me answer. Thanks. Real quick before we jump off this and I'll say this, there is the sticker shock that doesn't come with mainstream, but we are trying to do people don't realize there's actually been a couple really good recent publications.

If you have a poor prognosis for advanced cancer with insurance, you are likely, on average going to spend 140,000 to $220,000 in the first year of treatment.

It's not all once it's going to come in bills, but people, it is. It is expensive. And for people who are looking for that $20, it's just not. Unfortunately, it just isn't there.

It is going to be expensive. We're doing our best to keep this pretty low margin wise, but we still have to. There's a

lot of costs. So. So a couple things, right?

One, when you come to us and I'll tell you this, despite the sticker shock, we do not have a single one a recent illness treatment and complained about the cost.

They they see it. And we we actually have a generous refund policy. But that's only kicks in if like, look, if we can't treat you, something's changed.

We're not going to keep your money. We're going to give it back. But no. Afterwards you meet the team, you see the doctors, you see the science. You see, you know it's real.

You know we're legitimate and you don't feel like you were overcharged. Because you see everything that goes into this, it's a lot you can't and shouldn't count on insurance covering this, but don't just dismiss it.

Treatment Schedule, Follow-Up, and Access

We also, on your behalf, have brought on and work with a third party group that specializes in getting patients insurance reimbursement for medical tourism.

Thanks. A lot of what we do is standard. A scan is a scan, biopsies, a biopsy, larger labs, a lot of that. We've had patients who go home and they get a decent chunk of that back.

So we'll work with patients on that because we know it's expensive. So don't don't just immediately completely dismiss it. You can't count on it. Like, you know, you shouldn't, but you could get something back.

And we continue to look for opportunities to scholarship patients. We are working on a couple of innovations, one of which was I love that by a former patient of ours who is doing, and he want other patients come.

Actually, I'll give it a plug. They're the United Creed. They're doing a, event right now where I'm using is actually agreed to match dollar for dollar, up to 25 grand in donations.

Obviously, that's even after that, as much as we can be able to go. But I think that did more than just have access to this type of treatment, which, look, you know, you're seeing patients that oftentimes it's like, what do they have to lose?

Right. Because they are at a certain point where, you know, there's not much out there. They they've lost it. They've done it all the treatment. So now, very exciting.

So, Doctor Matt Halper, thank you. Man, I tell you that this has been a tremendous education. You know, we talked before and I'm like, I was missing a few key elements.

And now I feel like I can have a respectful and decent discussions discussion with patients when they ask me about, immuno seen final words and where can they find you?

And or information around immunocine. Yeah. So, you know, I'll give you final words just real quick, right? You can find us at immunocine.com. That's going to be the easiest place to find out, but you can also, find our our channels on YouTube, LinkedIn, Facebook, Instagram.

We try and put a ton of information out there. Go to the app as we talk about the price. We have a whole site designed to explain what you're paying for and what you're getting.

It's right there. We put the timeline there. We really do try. We also have made a ton of videos. There's a guide to treatment video on our home page.

It takes it there in a few minutes. It'll take you kind of through what you asked, beginning to end what it looks like.

We have an educational webinar in the Going Deeper section.

If you want to dive into the science. We have our inclusion criteria there. We have ways for doctors to refer patients. There. Like we really are trying to be very transparent and front and center with all the.

So you can find a ton of information just on our site and, you know, SI.com and a ton of videos and podcasts that that we've done where we really try and explain what it is we're doing.

My my final word would be. Look, every patient has the right to, of course, say, I don't want to fight this. I'm done. And that's true. But if you want to fight, even if you're being told by your doctor or the internet that there's nothing left to fight with, or there's no point.

Now, I would say respectfully, screw that. There are things you can do. There are smart people out there. There are lifestyle changes. There are valuable supplements. There are other options.

There's something like this and it's and it's your right to give up. Don't give up unless you want to give up because we've had patients and I wouldn't even call it give up.

Right. Because it's negative connotation. But man, that's a for some people I see it. Right. Because I can if you will, people always asking what would you do if you were me cannot answer that, cannot answer that.

I'm not you. I can say whatever I want my philosophy, my some of my ideas and if I have what you have, yeah, I might think completely differently, right?

So respect it. Say it. But those there are people that they have a lot to live for. They want to see their grandkids or the kids grow up. They have a lot to live for.

And and there's amazing, you know, options out there. What do they say? What do they say? Right? I mean, they say this patient, this is a patient who overcame the odds, right?

And we've seen a number of patients, a number of them. This is not a one patient thing. I'm telling you, we've seen a decent chunk of patients at this point come to us.

And at hospice level, it's bad. It's not so bad that they only have a week left, but it's bad and they are disease free today. We've seen it. And it's about the, Look, it's not a guarantee, but if there are things you can do to improve those odds and overcome those odds and live the rest of your live, go live good quality life, remodel your backyard, go on family vacations like that is still an option.

There is a way to get there. You just have to be. You just need to take a deep breath. It's good to have someone such as yourself, like in your corner, like, because there is a lot of noise out there, and, you know, there's just a lot and I and I, I understand that there's a lot of noise, even for scientists who, who kind of do know a little bit more, but even that is tricky sometimes.

So I do feel for laypeople, which is why we, we do so much to, try and explain this and, and make sure they feel educated about what this like. So, on.

I know, and you want to fight I it I appreciate your knowledge, your expertise, the amount of time that you spent on your research and helping all these, you know, patients that, you know, need your help.

So thanks so much, man. My pleasure. All right everyone let's self health advocates, thank you for having me. All right. There's a lot of information out there.

And I can only imagine when you apply, aggressive lifestyle interventions to your situation when you combine these marvelous treatments to aggressive lifestyle interventions.

To me, and certainly what I've seen is you manage you manage the cancer and your quality of life is a respectful, respectful one. So we only bring the goods.

As always, thanks so much for being, for listening and being a part of this Doctor Geo Prostate podcast community. Don't forget to, Drgeo.com newsletter.

We weekly. We have information there that you just not going to find anywhere else around prostate problems, urological problems, and even how to live better with with with age findings.

My clinical findings. So go there, sign up and I'll talk to you next time on the next episode. So long. Much love.