

Oklahoma Innovations Radio Show

Air Date: December 12-13, 2015

Guests: **Craig Shimasaki**, Moleculera Labs

>> From the OCAST Radio Network, this is *Oklahoma Innovations*, a weekly science and technology radio magazine, brought to you as a service of OCAST, the Oklahoma Center for the Advancement of Science and Technology. OCAST is the state's only agency whose sole focus is science and technology. The OCAST mission is to identify and fund promising research and technologies that allow Oklahoma to compete in a global market economy from our own backyard. This program features some of Oklahoma's most gifted scientists, inventors, entrepreneurs, manufacturers, educators and business leaders who all have one common goal: developing technology based economic growth for all Oklahomans. Now, here are your hosts Gary Owen and Chad Mullen.

[Music]

>> **Gary Owen:** We welcome you to this week's edition of *Oklahoma Innovations* and we are going to be talking today about disorders that I guess we could say are in the neurology area Chad right, would you say so?

>> **Chad Mullen:** Absolutely Gary, we're going to be talking about PANDAS and no not the cute and cuddly animals.

>> **Gary Owen:** Not the bears.

>> **Chad Mullen:** Not the bears, but actually a very serious issue that a company right here in Oklahoma and our guest today has helped discover a way to identify it, so we're excited about that. And then a corresponding disorder referred to as PANS and we'll hear more about that. But before we get started just a quick programming note, our spring intern program, intern partnership program should be open by the time this radio show airs. Our intern partnership program is open to all businesses in Oklahoma of any size, large or small. And some of us sitting around the table here today probably did internships in college and you sat in the back corner, did some filing, learned a little bit by osmosis.

>> **Gary Owen:** Right.

>> **Chad Mullen:** Our intern partnership programs are completely different, they are project-based. So a company has to put forth a project and then the intern has to play an integral role in that project. So we hope to have a commercializable outcome from the project and the student gets some great experience as well. And it's a pretty good program that we have, so I encourage you, anybody out there listening today to visit ocast.ok.gov and you can find the link for our intern partnership program.

>> **Gary Owen:** By the way I want to mention OCAST is doing a little survey among our listeners and we would love for you to take a moment if you would, go to the OCAST website and the best way to do it just type OCAST in your browser, it'll take you right to the website. And then if you would click on the radio link, we would really like to get your opinion about future shows and how often you listen to the show and what you like about the show and those kinds of things. We would really appreciate it if you take a moment because Chad I know the

leadership at OCAST really wants input from our listeners. We've been doing this show, we're in our 20th year doing this and we've had wonderful, wonderful guests like the one we have today, Dr. Craig Shimasaki, who's been our guest a number of times throughout the history of our show. And every time we bring him on he's got a new adventure path and Moleculera Labs is what we're going to talk about today. But talk about that survey because I think that's really important because I know OCAST has colleagues, as well as our general audience.

>> **Chad Mullen:** Yeah, you know, basically we do surveys on everything, so all of our clients, anybody that receives funding, our partner organizations and, you know, we simply incorporate that into our strategic planning to figure out what areas we will need to improve upon and focus upon. So we want to make sure and hear from you and just, you know, what do you think about the radio show.

>> **Gary Owen:** Right.

>> **Chad Mullen:** So it's four questions, it shouldn't take you more than a minute to do it.

>> **Gary Owen:** That's right.

>> **Chad Mullen:** It's very easy.

>> **Gary Owen:** Yeah, that's great okay.

>> **Chad Mullen:** And so ocast.ok.gov.

>> **Gary Owen:** Yeah, it's very simple, all right. Let's get on with our guest, Dr. Craig Shimasaki, welcome back to the show. My goodness it's been a while since we've had you and it seems like every time we interview you, you have a new project going on. Bring our audience up-to-date about you and a little bit about your history because you've done some pretty nice things in Oklahoma.

>> **Craig Shimasaki:** Yeah, well thank Gary, it's great to be back and you guys to be congratulated because 20 years doing anything is a lot time.

>> **Gary Owen:** Well you know you say that and being a weekend radio show on top of that, but it is the guests that make show that's for sure.

>> **Craig Shimasaki:** Yes. Well it's always good to be back here. I'm a serial entrepreneur and a business person, but my passion is about bringing to commercialization medical products and services that have a really unmet medical need that are really important, can make a difference in a person's life. And so I also teach as an adjunct at the University of Oklahoma.

>> **Gary Owen:** Oh, okay.

>> **Craig Shimasaki:** Entrepreneurship trying to help future entrepreneurs become successful in business. And one adage that I've learned and I like to use is the one that says, learn from the mistakes of others.

>> **Gary Owen:** Yes.

>> **Craig Shimasaki:** Because you never live long enough to make them all yourself, although sometimes I think I may have done that.

>> **Gary Owen:** We've all done that if we're entrepreneurs that's for sure/

>> **Craig Shimasaki:** Yes, but the company that I help cofound with Dr. Madeleine Cunningham, she's a professor at the University of Oklahoma is called Molecuera Labs and the reason I named it that is because it has to do with the term called molecular mimicry where pathogens or organisms that attack our body sometimes have similarity to other parts of our body. And when our immune system starts attacking or make antibodies against it, sometimes it misdirects it in an unfriendly fire and begins attacking our own body and these are called autoimmune reactions.

>> **Gary Owen:** Good explanation and that's were disorders occur.

>> **Craig Shimasaki:** Exactly.

>> **Gary Owen:** And diseases occur.

>> **Craig Shimasaki:** So for instance, rheumatoid arthritis is the immune system attacking the joints or Jean Barre syndrome the paralysis is where the immune system is attacking the nerves. Even type 1 diabetes is where the immune system is attacking the pancreatic cells. In this case, the immune system is attacking parts of the brain and causing what people see as symptomatic neuropsychiatric behavior like obsessive-compulsive disorders, separation anxiety, other types of motor tics and things such as even different types of uncontrolled bedwetting, suicidal behavior, anorexia. And so not all of these are caused by this underlying factor, but many of them are and the problem is most of these conditions, the neuropsychiatric conditions, are treated symptomatically with medications that affect the nervous system not the underlying root cause of the condition. And so what happens is they have side effects too that make things work and probably there's millions of people that are suffering from this type of condition.

>> **Chad Mullen:** And Dr. Shimasaki is this found in children, in adults, in both? What kind of - what stage frame you're targeting.

>> **Craig Shimasaki:** The condition called PANDAS and PANS we really don't know how many are afflicted by it, but based upon the symptoms we think maybe 2 to 3 million people in the US and 17 million worldwide can be afflicted by this. We also have some other interesting research that we believe, such as chronic depression, bipolar condition and schizophrenia may also have an underlying autoimmune root that when you treat the underlying immune system and infection if necessary, the symptoms resolve. And we've seen that by providing the diagnostic tests that we provide.

>> **Chad Mullen:** So what you're saying is sometimes children might have, you know, facial twitches or a lot of excessive eye blinking all the way to the -- possibly the extreme ends with, you know, pretty significant behavioral disorders and rather than that being symptomatic of a psychiatric disorder it was just caused by something maybe as simple as strep throat is that right or?

>> **Craig Shimasaki:** Exactly.

>> **Gary Owen:** Wow.

>> **Craig Shimasaki:** Yeah, in fact some of the things that we typically see is the sudden onset, the child was normal and then all of a sudden they started having behavior problems that may have been everything has to be lined up in a row or they can't wear certain clothing or they wash their hands excessively or they're afraid of contamination or they can't separate from their parents. And some of it all the way to the extreme of doing things violent because they're fearful

of something and maybe even attacking other people as a means of thinking that there's something going on that's going to harm them. And you mentioned motor twitches, maybe twitches, facial twitches, different types of motor tics, vocal tics, repetitive sayings, things you have to do over and over again. And rarely do people think of I wonder if that's an infection. There's an interesting article that says can insanity be contagious and in this case it's triggered by an infection.

>> **Gary Owen:** Sure, wow.

>> **Craig Shimasaki:** And that infection then causes the body to make antibodies that are misdirected and attack their brain.

>> **Gary Owen:** So in psychiatry, in psychology do they have any knowledge of this because you know that's the first thing, oh you need to go to the funny room you know. Well I mean what do you think about that, do they have this kind of background knowledge or is it discounted? Of course, it's relatively new discoveries that you're making.

>> **Craig Shimasaki:** Yes, the condition was first described probably about 20 years ago.

>> **Gary Owen:** Okay.

>> **Craig Shimasaki:** But it's been going on the symptoms for a long time and you're right Gary, this is an issue that normally psychiatrists and psychologists have not dealt with. And so normally they're going to look at something and they're going to treat what they see.

>> **Gary Owen:** Exactly.

>> **Craig Shimasaki:** Not understanding underneath it there's an infection that's triggering the immune system that's causing the behavior that they're seeing.

>> **Gary Owen:** So in a pre-psychiatric interview medical history is key.

>> **Craig Shimasaki:** Exactly.

>> **Gary Owen:** Wow.

>> **Craig Shimasaki:** And what we find in fact, one of our individuals that work with us she had had a child who had been suffering this for many years and it was devastating to the family because they couldn't function together without [inaudible].

>> **Gary Owen:** Oh wow.

>> **Craig Shimasaki:** Finally a psychiatrist who did know about PANDAS began asking a lot of questions about strep infections and sure enough, he had lots and lots of strep infections. And they took a test and found out he had strep titers were real high and then they ran our test, found he had antibodies against his brain.

>> **Gary Owen:** Wow.

>> **Craig Shimasaki:** And simple treatment for the child in this case was to kill the infection and with that he's back at the top of his class, he's behaving normally.

>> **Gary Owen:** Amazing.

>> **Craig Shimasaki:** Doing well.

>> **Chad Mullen:** And Gary had the opportunity to hear the individual that Dr. Shimasaki is speaking of speak and it was really -- it just struck me how just really kind of the pain and suffering that the family was going through. And so in this case the child's mother just was about to give up hope really.

>> **Gary Owen:** Oh sure.

>> **Chad Mullen:** Had a child that was just -- did not sleep, you know, and stayed up all night and, of course, that wears you out and makes it very hard for you to.

>> **Gary Owen:** Absolutely, you can't function.

>> **Chad Mullen:** As a parent you can't function.

>> **Gary Owen:** Yeah.

>> **Chad Mullen:** And it kind of snowballs and so it was an incredible story to hear about how frankly something so simple that was so easy to take care of took over a year I believe, I mean correct me if I'm wrong, to diagnose and treat. But because of this Cunningham panel that we have here, being developed here in Oklahoma we're able to do that very quickly. So and the child today gives a much better speech than you or I could so.

>> **Gary Owen:** Wow.

>> **Chad Mullen:** It's really incredible to see.

>> **Gary Owen:** Isn't that amazing.

>> **Chad Mullen:** To see the improvement that he's made so.

>> **Gary Owen:** So we have about a minute before we go to the break. You also used the term PANS, give us a quick differential if you will between the two, what's PANDAS -- what's the difference between PANDAS and PANS.

>> **Craig Shimasaki:** Okay, so long acronym is PANDAS stands for pediatric auto-immune neuropsychiatric disorder associated with streptococcal infections. The only difference between PANS and PANDAS is the S which refers to strep is removed. So PANS is pediatric acute onset neuropsychiatric syndrome, which can be caused by Lyme disease, mycoplasma, influenza, everything else, but it's the same syndrome.

>> **Gary Owen:** That's fascinating stuff. Wow, we have so much to talk about and then as you tune in to this program I'm sure you have a lot of questions that I wish you could ask for, but we're going to try to ask them for you because obviously one of the first things, especially parents are going to want to know is how do I flag my doctor that maybe we need to get this test done. So we would definitely want to talk about that. I want to talk about how all of these discoveries happened, occurred and the exciting news is some treatments that you have. We have more to come on our program, *Oklahoma Innovations*, with our guest, Dr. Craig Shimasaki, always a great guest to talk about, always a wonderful entrepreneur, and you never know what kind of thing he's going to come up with and this is a good one. We'll be right back.

>> Now in its 20th year this is *Oklahoma Innovations* on the OCAST Radio Network.

>> **Gary Owen:** Our guest this week is Dr. Craig Shimasaki, he's been a wonderful guest over the tenure of this show, 20 years, and he's always got a new project that he brings to us. And the project right now is Moleculera Labs and they are doing some wonderful studies on how the

immune system can reverse itself within the body, I guess it's a good way to say it. They start attacking healthy cell tissue, it could be in the brain, it could be in the vital organs or wherever, am I saying that right?

>> **Craig Shimasaki:** Exactly. The immune system is one of the most powerful organs in the body and it's there to help protect us from foreign invaders. And PANDAS and PANS an infection occurs just like anybody else, but what happens is in those children or sometimes adults, the immune system finds certain parts of these infectious agents and they're actually almost identical or nearly identical to different parts of their body. So if they're nearly identical or very similar to our brain, these particular antibodies that are made through what we call molecular mimicry are triggered to begin attacking not only the infection, but begin to attacking let's say the brain. And in these children when they start attacking parts of the brain, they can actually trigger the symptoms like.

>> **Gary Owen:** Oh my.

>> **Craig Shimasaki:** OCD or loss of bladder control or separation anxiety or thought processes or things that cause the different types of vocal tics. But the whole host because there's so many different parts of the brain that have different functions, it's sort of the unlucky draw where it's attacking. Which is why the symptoms for PANDAS and PANS are so heterogeneous, meaning there's so many of them it's not very easy to diagnose just by looking at a patient.

>> **Gary Owen:** And that's why children with PANDAS or PANS are often misdiagnosed right?

>> **Craig Shimasaki:** Exactly, it's one of probably the case that we hear so often is the parents that have been surveyed by some of these family groups have gone anywhere from 5 to 15 doctors before they've ever found someone who knew about this.

>> **Gary Owen:** Wow.

>> **Chad Mullen:** And it's interesting we're talking about this, I actually have a family I'm aware of who had a child who had strep throat several times, you know, had it kind of it almost seemed like it was becoming chronic or habitual so to speak. And at the same time was diagnosed with Tourette's syndrome and had begun some treatment on that. And no history of Tourette's in the family, it just seemed like an odd diagnosis. And so the family, thanks to working at OCAST I was aware of PANDAS and PANS and we found a pediatrician in the area that was also familiar with it and had used the test in the past and the child's underground tests and we're hoping that -- I guess you can say we're hoping [inaudible] PANDAS or PANS. But has the ability to treat it through that, so it's exciting to know that there are some of these things that we've treated very aggressively through, you know, pretty substantial drugs in many cases, psychotropic drugs. We are able to now perhaps just treat with a strong antibiotic, so very interesting.

>> **Gary Owen:** I want to bring that up as a question, you know, sometimes we as human beings we also are very sensitive to certain medications. Our doctors do our best to treat us appropriately, but sometimes that's a misfire, we have reactions to certain drugs. Is that a compound of this issue?

>> **Craig Shimasaki:** It is, it's certainly that our bodies are very diverse and they can have different reactions and the immune system is also one of them. Normally what you can see in some of these families that there may be a family history of autoimmune issues and when I say that it may be even something like psoriasis or arthritis or Crohn's disease.

>> **Gary Owen:** Right.

>> **Craig Shimasaki:** Or MS because what happens is the genes are susceptible to maybe some different changes. But as you mentioned there Chad, the good thing is that PANDAS and PANS then are treatable and they are resolvable because it's an underlying infection triggered immune problem. You treat the infection, you treat the immune system, the neuropsychiatric symptoms go away. And we've seen that with many, many, many children.

>> **Chad Mullen:** Now Dr. Shimasaki, if I'm a parent and my child is experiencing these type of symptoms, what's the first thought for me? Is there a website out there that I can find some information on, should I reach out to my pediatrician. Tell us a little bit about the process if you're a parent.

>> **Craig Shimasaki:** Certainly, most of these parents are on the web about 2 to 3 in the morning because we know that by the e-mails and the requests, but researching.

>> **Gary Owen:** It's because they're not sleeping with worry.

>> **Craig Shimasaki:** Looking for information. Our website molecularalabs.com, we have a whole bunch of resources and videos. There's another website, there's many websites on PANDAS network that are parents that have started to try to educate other parent.

>> **Gary Owen:** Nice.

>> **Craig Shimasaki:** There's a New England PANDAS Association, another five parents that started it. And they're trying to educate people so they don't have to go what they went through all their life trying to find answers.

>> **Chad Mullen:** And so for those of you that are at home or in the car right now, Moleculera Labs is spelled Moleculera Labs.com or just Google Moleculera or just Google PANDAS and PANS and you'll be able to find the website very easily for their. For physicians that may be listening, are there some resources you have available for them to learn more about it?

>> **Craig Shimasaki:** Definitely, there's a group of physicians, including those from all over the country and at Stanford and the National Institutes of Mental Health who put together it's called the PANDAS Physician Network.

>> **Gary Owen:** Oh cool.

>> **Craig Shimasaki:** Not just PANDAS network, but PANDAS Physician Network. They have practice protocols, they're trying to build many education helps for physicians. And then also the parents can take some of these downloadable materials that we have and take them to their doctor. We have publications that identify this and many good helps for these doctors because it's like anything else. If they're not aware of it you don't really know what it is that you're dealing with, but it's been the parents for the most part that have been partnering.

>> **Gary Owen:** And this website you had mentioned to us off the air mykidisnotcrazy.com, there's some videos on there I understand that parents will relate to right.

>> **Craig Shimasaki:** Exactly, a University of Florida professor of media he began this year-long documentary to follow for parents with their children and their plight with PANDAS and you'll see this on mykidisnotcrazy.com.

>> **Gary Owen:** Mykidisnotcrazy.com all right, that's a good one to note. We have a lot more information to share with you about Moleculera Labs when we return. On your science radio magazine from OCAST, *Oklahoma Innovations*. Stick around I think you'll enjoy the rest of the hour.

[Music]

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[Music]

>> **Gary Owen:** If you've just joined us this is *Oklahoma Innovations* and this week we are talking with Dr. Craig Shimasaki. If you've been a long-time listener of this program you know that Dr. Shimasaki is a scientist and entrepreneur and he's doing wonderful things in the medicine world to try to help individuals find the right treatments. And I guess one of your assets is you're always developing tests for various kinds of things and this one is interesting. We'd like you to write this down Moleculera Labs. Moleculera Labs, Moleculera right?

>> **Craig Shimasaki:** Era.

>> **Gary Owen:** Era excuse me, I didn't type that that's why I got a red line under there look at that it says Moleculera dummy. But anyway we were talking before the break about mykidisnotcrazy.com, we didn't have time to elaborate about it. We'll talk about that website for just a moment for parents, they to know about this and grandparents too.

>> **Craig Shimasaki:** Yes, it's very interesting if you pull it up, it's actually a university professor at the University of Florida in the media department I believe, his name is Tim Sorel and he has been following four families with PANDAS children and the plight of all that they go through in their struggles, in finally finding an answer, and then hopefully getting treated. And there's a trailer out under that website mykidisnotcrazy.com and it should be actually airing sometime next year for the full documentary.

>> **Gary Owen:** Wow nice, okay.

>> **Chad Mullen:** Dr. Shimasaki, tell us a little bit about where did that test come from, was it developed here in Oklahoma? Tell us a little bit about the history and about Dr. Cunningham, Dr. Marilyn Cunningham who created the test.

>> **Craig Shimasaki:** Yeah and so serendipity like anything else is a part of this. Dr. Cunningham is a tenured professor over at the University of Oklahoma and she's been studying strep bacteria and immunology. And so I won't tell you how many decades she's been doing it to give away her age. But Dr. Susan Swedo who is at the National Institutes of Mental Health, probably about oh 18 years ago had this cohort or this group of children that had a lot of unusual neuropsychiatric behavior problems, but all of them had proceeded with a number of strep infections. And so it kind of clued her into thinking maybe there's something tied here. We also know condition called Sydenham chorea, which is older but it's a strep infection that infects an individual. They have these chorea formed movements, but then it turns into rheumatic fever. And so she contacted Dr. Cunningham and she actually, Dr. Cunningham was developing tests and working through a panel of five tests, which we run to see if any of the antibodies in these children are directed against different parts of the brain by using these brain proteins in our tests. And sure enough many of these kids in fact, the vast majority of all of them did. And so when the study was done that was concluded, but for about a year parents through word-of-mouth were telling other parents and they kept calling for about a year asking for help and there was nothing she could do. So she contacted me and asked what can we do to help them and that's how the company got started.

>> **Gary Owen:** Wow, interesting.

>> **Chad Mullen:** Yeah, a very interesting story and so tell us a little bit about after that phone call, how does one go about starting a company in this field? I'm sure it's not as -- well it doesn't sound easy and I'm sure it's even harder than that.

>> **Gary Owen:** Money it takes money.

>> **Craig Shimasaki:** It is yes, yes. So I like to tell people it's kind of like you going to Oklahoma and wanting to go to New York City, there's probably at least 100 different paths you can go.

>> **Gary Owen:** Right.

>> **Craig Shimasaki:** But as long as you head north and east everyone will eventually get there, maybe not at the same time or the same cost. So a lot of it has to do with having a very important unmet medical need in this case that is not being served and that people are not having any success with, as far as getting treatment or testing. The second is then finding a way to pay for it, meaning reimbursement. And then the third is being able to convince enough people that believe and see the vision and the mission that they would actually put money in to believe that maybe.

>> **Gary Owen:** Yeah.

>> **Craig Shimasaki:** There's something that's going to happen that will benefit them as an investor in the future.

>> **Gary Owen:** Sure.

>> **Craig Shimasaki:** And so all those things coming together, of course lots of very good people that we wouldn't be here without the team of people that we have, nurses and every type of discipline in our company. But we started actually it was just myself and Dr. Cunningham in 2011 and we didn't open the lab until April of 2013. And we were actually offering the test literally in 42 states and probably oh, I don't know how many countries, about 30% of our orders come from out of the United States.

>> **Chad Mullen:** And tell us a little bit about that, you're in 42 states, but there's some processes that you have to go through to be in the states is that correct or?

>> **Craig Shimasaki:** Yes, certain states not all of them, but some of them require additional licensure. We are licensed now in 49 states and some of it is getting physicians aware of what we're doing, but you have to apply for it and then you have to demonstrate that you're proficient, you have to get inspected and CLIA and COLA, the hospital type laboratory accreditation bodies have inspected us and we passed three times with no deficiencies.

>> **Chad Mullen:** Well that's good.

>> **Craig Shimasaki:** And they've given us an award of excellence.

>> **Chad Mullen:** And those are not difficult tests to pass by any means. And then -- and now I think this is interesting, you know, one of the things that we talk about here at OCAST is the difficulty of launching a company like this that there's no known market and a lot of folks, I mean many, many folks in the medical field are not aware of PANDAS or PANS or it certainly doesn't come to mind. I think it's a fair statement to say that most individuals are not aware of this statement. So I mean you have to not only launch a lab, but simultaneously inform customers, you know, across country and around the world and I assume you have to work with insurance companies as well to cover, I mean I'm assuming there's not a code for PANDAS or PANS or?

>> **Craig Shimasaki:** There's actually codes for the process.

>> **Chad Mullen:** Okay.

>> **Craig Shimasaki:** For the tests that we use and so for [inaudible] and for cell culture and radioisotope assays which we run, so we bill under that.

>> **Chad Mullen:** Okay.

>> **Craig Shimasaki:** And we bill on behalf of the patient because we want them to benefit from it and often they'll use those results to help them justify and pay for the treatment because it provides evidence that they've got an autoimmune condition.

>> **Gary Owen:** Well see and I would think from an insurance standpoint it's going to save them money because you got to the root cause.

>> **Craig Shimasaki:** Exactly. A short period of treatment and recovery versus lifetime of possibly.

>> **Gary Owen:** That's my point yeah.

>> **Craig Shimasaki:** Of psychiatric drugs.

>> **Gary Owen:** Absolutely.

>> **Craig Shimasaki:** Yes.

>> **Gary Owen:** Which are very expensive in some cases, so that's awesome.

>> **Chad Mullen:** Now you've had some -- how are some of the ways that you've reached out to physicians and parents simultaneously? How have you marketed this or raised the awareness of this disorder?

>> **Craig Shimasaki:** Yes, it's education a lot of it is. So we have a staff that do help not enough, but we have people that go out and Dr. Cunningham and myself we speak at different presentations or conferences, we'll go and we'll provide exhibits there. We actually now have many physicians who have found about us, used it on their patients, tested them be positive, treated them and they're well. Now they are actually spokespersons for us.

>> **Gary Owen:** Nice.

>> **Craig Shimasaki:** So they will go around and they will help speak to their colleagues and we have those now. So they become the best people to help educate. We do publish research, Dr. Cunningham continues to do that, we are doing that too. But the combination of that and collaborating with lots of doctors and then the awareness day. We had there's 28 states who's adopted at least a proclamation or resolution to recognize October 9th as PANDAS PANS awareness day.

>> **Chad Mullen:** That's fantastic and that included right here in Oklahoma and they had a ceremony at the capital, several great folks speaking and including the story we told at the very first segment about the young man, 9 or 10-year-old I believe who had suffered from PANDAS and was cured. It was a great ceremony and those things and you're hoping to maybe make this a permanent, so we have PANDAS and PANS, excuse me awareness day every year [inaudible], is that correct?

>> **Craig Shimasaki:** Exactly, we're working towards that so that it'll grow a resolution in the state. The other thing you mentioned really about entrepreneurship is I like to -- as I do try to share this with students and professors is that everything that we see with our eyes was actually created in the mind of someone many years before it has ever come into existence and I'm referring to things that are man-made. Whether it's a company, whether it's a structure, whether it's a building, whether it's anything someone had to see it in their mind before it ever existed.

>> **Gary Owen:** Sure.

>> **Craig Shimasaki:** And then had to find people that they can share the vision with and then people who would believe in that and follow for a period of time and then creative problem solvers to overcome every type of problem and obstacle in the way. And that is something that I use illustration about the Eiffel Tower. The two engineers that proposed it that nobody knows their name had to convince Gustave Eiffel for a year that it's something worth building and he did not want to build it.

>> **Gary Owen:** Wow, isn't that interesting and now look at it. I don't now Paris wouldn't be Paris without the Eiffel Tower my gosh, you know. I tell you Dr. Shimasaki you always bring something exciting to our radio program and before we get off the air here in our next segment, we want to give our parents and doctors and medical professionals who listen to this program some more information about where to go and research all of this okay. We've got to take a little break, we'll come back and wrap up with Dr. Shimasaki in our next segment. You might want to grab a pencil and a piece of paper and write some of this information down when we come back on *Oklahoma Innovations*.

[Music]

>> This is the one of the longest running weekend radio talk shows in America. *Oklahoma Innovations* on the OCAST Radio Network.

[Music]

>> **Gary Owen:** Dr. Craig Shimasaki is our guest with Moleculera Labs and it's moleculeralabs.com.

>> **Chad Mullen:** Try again Gary.

>> **Gary Owen:** Moleculera Labs.com, it didn't come out of my mouth.

>> **Chad Mullen:** There you go.

>> **Gary Owen:** Right. That's a tough word to spell.

>> **Craig Shimasaki:** It is.

>> **Gary Owen:** Wow and I'm looking at right at it, it still didn't come out right. I need to get checked okay, I need to get checked, maybe I got something here.

>> **Chad Mullen:** Or just Google PANDAS and PANS.

>> **Gary Owen:** There you go that's.

>> **Chad Mullen:** Oklahoma and it'll come up so.

>> **Gary Owen:** By the way, something we should mention here Chad that, you know, I think we touched on lightly at the beginning of the program, but there are a lot of brochures on your website.

>> **Craig Shimasaki:** Yes there are.

>> **Gary Owen:** Informative brochures that cover almost all areas and answer a lot of the questions that people will have.

>> **Craig Shimasaki:** Yes, so any parent or physician or physician they can go to the website, download the brochures. If they are a parent and they have a physician that doesn't know about it, they can download it, printed it out, take it to the physician. There are many research

publications that they can send to the physician, but the more education that they can give the more people that will be helped by it in the future.

>> **Gary Owen:** Now Chad wanted to ask you a question about entrepreneurship because you as long as I've known you, you've done a lot of discoveries, you've helped build some companies and you've had your ups and your downs like any entrepreneur.

>> **Chad Mullen:** And Gary he actually wrote the book on the business of bioscience, which I believe is the correct title right?

>> **Craig Shimasaki:** Yes.

>> **Chad Mullen:** The Business of Bioscience and you've actually written two books, tell us.

>> **Craig Shimasaki:** Yeah.

>> **Chad Mullen:** The title of those two books, the full titles.

>> **Craig Shimasaki:** The first one is called the Business of Bioscience, what goes into making a biotech product and it really was to help, it was a chronicling of the journey that I went through and then the lessons that I've learned trying to actually just because I couldn't find any books to help me when I was going through this. And one publisher said that this would be great to publish, so I sent that in. But that was sort of a do-it-yourself, how do you start a company, what's involved and what do you need to do. The second one is actually a textbook that's used in many universities really around the world for their biotechnology entrepreneurship programs. And hence the name biotechnology entrepreneurship, Starting, Managing and Leading Biotech Companies.

>> **Chad Mullen:** And I think it's important to note that starting a biotech company is much different really in my opinion than starting and any other company. A lot of things are similar, but a lot of things are different. Tell us a little bit about that.

>> **Craig Shimasaki:** Yeah the order of magnitude of things and length of time. The average time really for a diagnostic and therapeutic to get to the market is anywhere from 7 to 12 years.

>> **Gary Owen:** Whoa.

>> **Craig Shimasaki:** For the low-end, for maybe a diagnostic is 25 million to a therapeutic it can be for 4 or 500 million. And so, therefore, it's very important to not have to learn the same things over and over again. And this is hence that my desire was to try to pass on information because a lot of the biotech pioneers, biotech industry is only 40 years old. But if you put that timeframe for these different drugs in development, there's really not that many generations and many of the early ones are passed away. And so these pioneers what I tried to do is get them to help write part of the second book and share that knowledge so that the next generation can able to do these more effectively.

>> **Chad Mullen:** And I mean kind of put this in perspective Gary, imagine if I went to the banker and I said, I'm going to start a heating and air company, I may get one customer in seven years from now and it may be 10 or 12 years from now, kind of depending on how it goes out. But I'm going to need several million dollars, I'm going to need 10 or 15 employees and a wide network of folks kind of test my theory and do you want to go ahead and give me a loan now. I mean it's a very difficult and I think a lot of people don't understand just how difficult it is to launch a company that you are not going to make a sell for probably a decade in many cases. So

tell us a little bit, there's some funding opportunities here, both in state and in the country and abroad. Tell us a little bit about one you would go about funding or how you did.

>> **Craig Shimasaki:** Yeah, so I actually came from San Francisco, I worked at Genentech back in 1983 to 87 and there's a lot of venture capital money for start-up companies on the west coast. And then coming to Oklahoma and we helped start a company here. There's not as much, but there is money here. And the other thing is that there is a good environment for that. So the institutions you're involved with, both of you, OCAST has been a very, very big supporter of all of the companies literally that I've been involved with from providing the grants to some of the money that helps get the research going. I2E the growth has been actually one of our biggest supporters, investors and then Seed Step Angels and then even reaching outside of that to some groups called St. Louis Arch Angels and Prolog Ventures and then even entrepreneurs down in Austin and then really in the east and west coast. So you've got to be creative.

>> **Chad Mullen:** Sure.

>> **Craig Shimasaki:** And you've got to find where people are interested, but it's that tenacity to keep going.

>> **Chad Mullen:** And Gary talk about Seed Step Angels a little bit, OCAST created a program many years ago actually, but only began providing funding to it a few years back called the Seed Capital Program. We provide an annual amount to I2E, so we have a contract with them to carry that out for us and one of things that we asked them to do was to find some private capital to co-invest with the state money and in fact, design the program parameters around that. And I2E has done an outstanding job in developing the not only managing the Seed Cap Program, but building of the Seed Step Angel. It's a network of angel investors and I'll let Dr. Shimasaki talk a little bit about the difference between a venture capitalist and an angel investor, but essentially have a lot of dormant capital here in Oklahoma and some of it is from oil and gas, some of it is from other things. But we have folks that are SEC qualified investors that have some capital that they can invest and they can withstand a loss that's idea behind it. And these folks are really stepping up across state and I believe we have about 50 of them now.

>> **Gary Owen:** Wow, nice.

>> **Chad Mullen:** Roughly in the state.

>> **Gary Owen:** That's great.

>> **Chad Mullen:** That are able to co-invest on deals. And so Dr. Shimasaki tell us a little bit, what is the difference between venture capital and an angel investor, is there much difference or?

>> **Craig Shimasaki:** Yeah, certainly there's probably an order of magnitude in far as the zeros that are attached to the numbers that they invest.

>> **Chad Mullen:** Sure.

>> **Craig Shimasaki:** But usually angels invest somewhere from 25,000 apiece to maybe 150 or even more, whereas venture capital must have at least somewhere in the order of a couple million to tens of millions in order to be able to put in a company because they manage things like 200 million and it takes as much work to manage a million as it does to do 10 million.

>> **Chad Mullen:** Sure.

>> **Craig Shimasaki:** So that's the part that we need a little more help with in the state, but I think good successes will help attract venture capital to the state, which would help yeah.

>> **Gary Owen:** But entrepreneurs like you you've got a good track record and people know who are you are. I mean he's probably in a room with investors and they're like oh there's Dr. Shimasaki he's going to want more money. Just kidding, just kidding folks, just kidding. Okay, we have just a couple of minutes left and I want to give enough time to provide information to our listeners who are interested in this. You may have a family member, a child or a grandchild who may recognize the possibility that there may be something else underlying going on that maybe needs to get checked out. So give some good advice to our listeners out there about what your research is doing and how it's helping patients, kids out there okay.

>> **Chad Mullen:** And what's the process, how would you get the test?

>> **Gary Owen:** How do we do that yeah?

>> **Chad Mullen:** Yeah.

>> **Craig Shimasaki:** Yes, so if you're a parent or a grandparent or anyone and thinking maybe that the some of these underlying auto or neuropsychiatric symptoms may be autoimmune, the first step in the process is find a physician that would actually order the test because not all of these are autoimmune related.

>> **Gary Owen:** Right.

>> **Craig Shimasaki:** But the ones that are can actually be effectively treated. So once you find a physician that can actually order the test because we only take physician orders, they actually sign up onto our website portal and login at the same website moleculera.com and they will then place the order and there will be an e-mail generated to the patient to put in their insurance information. We require a deposit and then also a kit will be sent to them.

>> **Chad Mullen:** And how do you find a physician?

>> **Craig Shimasaki:** They can ask us too, but generally they're already seeing a physician and often what they'll need to do because they know the most about the patient history, try to talk to them about being open to consider something else and then provide the research to them.

>> **Chad Mullen:** Sure.

>> **Craig Shimasaki:** Because they're like anyone else, they're learning as they go along and I think that's why they call it practicing medicine maybe.

>> **Gary Owen:** Yeah, yeah. But I know that the bigger the doctor network gets the more that the word spreads about what you're doing and this is just one of many medical discoveries going out they're nationwide that it takes a while to get that buzz going doesn't it? Get the articles read and the information out into the public or.

>> **Craig Shimasaki:** Oh yeah, I don't know if you remember Gary where they had peptic ulcers we thought that always were caused by stress and too much acid and one researcher said no, it's caused by a bacteria called helicobacter pylori. And then people thought he was crazy and.

>> **Gary Owen:** Wow.

>> **Craig Shimasaki:** So he ended up swallowing it and proving that it actually did.

>> **Gary Owen:** Oh my.

>> **Craig Shimasaki:** And now it's not -- it's the first thing someone says they've got an ulcer, they'll get a test for helicobacter, the bacteria.

>> **Gary Owen:** Wow.

>> **Craig Shimasaki:** And then get antibiotics and then they'll be on their way. So medicine does change and it is a matter of making sure that there is adequate science before something gets adopted.

>> **Gary Owen:** We encourage you to go to molecularalabs.com and check it out. Also type in PANDAS or PANS for symptoms and other information. Great resources of information out there and once again if you missed it at the top, mykidisnotcrazy.com great videos there for you parents and grandparents to research. And thank you so much for coming and sharing this information and I'm sure you've probably raised a lot of ears out there that will maybe check with their doctors and pediatricians and maybe look into some concerns.

>> **Craig Shimasaki:** That's our hope [inaudible] people.

>> **Gary Owen:** Well we look forward to talking to you again and keep us informed of your growth okay. Chad, it's been a great show.

>> **Chad Mullen:** Enjoyed it, fantastic stuff.

>> **Gary Owen:** And I know now how to spell, I don't know what's the matter, I think I need to get my eyes checked or up my allergy meds, I haven't figured out why. All right, well listen you guys have a great week, we'll talk to you next time on *Oklahoma Innovations*, have a great week.

[Music]

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