

Oklahoma Innovations Radio Show

Air Date: February 4-5, 2012

Guests: **Tom Kupiec**, Analytical Research Laboratories, and **Brandt Cassidy**, DNA Solutions

[Music]

>> 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 focus is technology, its development, transfer, and commercialization. OCAST's mission is to locate and fund promising technologies and allow Oklahoma to compete in a global market economy from our own backyard. This program features some of the state's most gifted and talented scientists and inventors, entrepreneurs, manufacturers, 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 Steve Paris.

[Music]

>> **Gary Owen:** Thank you, Andy, and welcome to another edition of Oklahoma Science Radio Magazine, *Oklahoma Innovations*, Steve Paris.

>> **Steve Paris:** Hey, Gary.

>> **Gary Owen:** And I try to bring you some interesting guests. Today is going to be a fascinating show if you're into the genetics, if you're into DNA. This is one of those shows that you're going to want to listen to, and there's some unique twists to -- about this [inaudible].

>> **Steve Paris:** There are. Gary, you just barely scratched the surface.

>> **Gary Owen:** Barely scratched the surface.

>> **Steve Paris:** You talked about Dr. Tom Kupiec's companies, three companies you're going to hear about today. And Dr. Kupiec has been a part of Oklahoma's research community for quite a few years now.

>> **Gary Owen:** Yes, that's right.

>> **Steve Paris:** And he still looks very young, but...

>> **Gary Owen:** He does, doesn't he, yes.

>> **Steve Paris:** ...at any rate, he's going to be talking with us today about some of the -- where he's taking his companies, all the things they're doing now. And, you know, I thought I was pretty familiar with the three companies that he works in that he owns and started, but, you know, they're doing a lot of things that I just recently found out about.

>> **Gary Owen:** Steve, you've got to get out.

>> **Steve Paris:** I know, I've got to get out more.

>> **Gary Owen:** You've got to get out more, yes.

>> **Steve Paris:** But you need to stay tuned to hear about Dr. Tom Kupiec and what he's doing with ARL DNA...

>> **Gary Owen:** ARL DNA Solutions, right.

>> **Steve Paris:** ...Solutions, and the Kupiec Group, and you're going to hear some things I think that you'll be surprised to find out are happening here in Oklahoma right in your own backyard.

>> **Gary Owen:** Hey, there was an article a little over a week ago in the newspaper business section. Headline says, "OCAST Seeks Funding Hike." It was an interview with your executive director, Michael Carolina. And this is not anything new as with Allstate agencies. Obviously everybody's looking for additional funding. But what I liked about the article is it showed this is one agency -- it is one of some of the agencies in the state that is really proving itself as generating helping to create jobs, helping to fund science and technology here in Oklahoma, and why that's so important to this state. I love hearing that, Steve.

>> **Steve Paris:** Absolutely, Gary. You know, I can go back about 20 years when I first became involved, and we had a difficult time back then, you know, finding examples, finding companies, businesses, researchers in Oklahoma, who could give us examples of things we were looking for. That's not the case today. There is a lot of research that has gone on that has been accomplished that is in my way thinking has put Oklahoma on the map.

>> **Gary Owen:** Absolutely.

>> **Steve Paris:** And people are looking at Oklahoma now not just as a place where you raise cattle and grow wheat, or not just as a place where you drill for oil and natural gas, although those are all very important in parts of our economy, and will remain so for many years. We've also added R&D, research and development, and some of the things that have come down the pipe we've got companies that are operating, we've got people coming to Oklahoma saying, "I didn't know you guys did that." And that's the part I think that is indicative to me -- and that's so anecdotal, but you look back and see how many people are involved in R&D, the companies that have been started, the great things that are happening. And by the way, one of the things that we always tell folks is that when you invest in R&D, the jobs that are created are much better than the average job in Oklahoma -- and I don't mean that to belittle those average jobs, because we need all of those, but when you can develop jobs that average \$63,000 a year, versus the state's, what, 32, 34 thousand dollars, you may be 35,000 a year, I mean, that's economic growth. That benefits all Oklahomans. So, and that's our story. You know, some people focused on how much money we're asking for, and let me explain that. We know that the State of Oklahoma is coming out of a difficult time, as is most of the country. We're in better shape than most. We have a lower unemployment rate, and we have -- our two major cities -- our other cities also, but our two major cities are really showing up very well in places where the -- where it's easy to do business.

>> **Gary Owen:** And look how innovative we are in drawing business to our state...

>> **Steve Paris:** That's the point.

>> **Gary Owen:** ...coming into Oklahoma City, for example.

>> **Steve Paris:** And that's just one example, but that is a good example. But when we ask for \$43 million, okay, people say, "Wow, why do you want so much?" Well, our goal, our mission, we're required to tell the legislature every year what the demand is. And we go back and look at the number of research projects that we cannot fund because we don't have the money. And what we do is analyze that. It doesn't take long to do that, and figure out, "Okay, if we'd had had this much money we could have funded all of these projects." Now, not every project that comes to

us is worthy of funding. Most of them are, and most of them while worthy of funding have been determined by outside peer review that this is a good research project. Unfortunately, we can't reach most of them. We can reach the top ones, but we have difficulty reaching all of the good quality R&D projects in the State of Oklahoma. That's why we tell them to really do the job right we need this much money.

>> **Gary Owen:** What kind of -- you know, to the listener they may say, "Well, if you didn't get 40, but if you got a good percentage --"

>> **Steve Paris:** Well, let me just put it this way, we're [inaudible] --

>> **Gary Owen:** How much in revenue could you generate?

>> **Steve Paris:** Well, I'll tell you that, but we're operating right now on about 18 and a half million a year.

>> **Gary Owen:** Okay.

>> **Steve Paris:** So, we're a long ways from that 43.

>> **Gary Owen:** Absolutely, absolutely.

>> **Steve Paris:** And do we think the legislature is going to give us 43 million this year? Well, we hope they would but I doubt it because they're --

>> **Gary Owen:** Hey, it doesn't hurt to ask.

>> **Steve Paris:** Well, it's not that we're asking as much as we are informing them of what the demand is. So, it's not like we're going in saying, "Well, you know, you've got to give us this much money." That's not the case at all. We're advising them of where we know we are as far as demand goes. You talk about money, right now we're getting \$20.39 for every dollar that we've expended over the entire history of OCAST. So, we put out about \$214 million and 23 --

>> **Gary Owen:** A nice return for your tax dollars.

>> **Steve Paris:** Well, it is. Now, I can remember a time not too long ago, 15 years ago, when we put out this -- and we were getting five and six dollars in return, but it rose because some of those research projects that we funded ten or 15 years ago are producing results today that will be business five or ten years from now; not everyone, but a lot of them are. And so, you know, we have a growing return, and when we talk about a return, that gets to be a little confusing. Some people try to apply perfectly to, you know, business receipts, and it's not always that. Sometimes it's for every dollar we put out we're able to attract \$20 worth of outside funding for more research. And that can come from the private sector, that can come from the federal government, it can come from any number of sources other than state money. And so that's what all that means is you've got to be aware of the nuances. But here's the number that I'm proud of. Over the 23-year history of this organization, if you take the \$214 million that we put up of the state tax payer dollars, we've been able to attract \$4.3 billion.

>> **Gary Owen:** Wow.

>> **Steve Paris:** Now, when I say we attract that, our researchers attract that, because they use OCAST money to convince, you know, The National Institutes of Health, the National Science Foundation, various defense departments, to put money into research projects that we funded. And if we put research money together, it has a tendency to attract more money because

somebody looks at that and say, “Well, if they think it’s worthwhile, we probably should give it another look.” And so that’s what happens.

>> **Gary Owen:** Yes, absolutely.

>> **Steve Paris:** And we’ve done this to position Oklahoma’s research community as a place where good research is done.

>> **Gary Owen:** And, you know, the other benefit that that switch is always an important asset to Oklahoma we have some wonderful higher education universities and colleges in our state. And there are so many -- thanks to OCAST and its strategic partners who have helped our students, have a better experience in the sciences when it comes to sciences when you look at your intern partnership programs and things like that, which have also helped us retain our students in the state by giving them more...

>> **Steve Paris:** Absolutely.

>> **Gary Owen:** ...[inaudible] job opportunities and those kinds of things, so...

>> **Steve Paris:** It does, and of course...

>> **Gary Owen:** ...it all adds up.

>> **Steve Paris:** ...you know about our special, you know, intern partnership program. But, you know, let me talk about this in a much broader sense, because, you know, I am not trying to tell you that OCAST has done every bit of this. That’s not true.

>> **Gary Owen:** Oh, gosh, no, no.

>> **Steve Paris:** We’re one of the cobs...

>> **Gary Owen:** Absolutely.

>> **Steve Paris:** ...so to speak, one of the gears. Higher education is involved. Private sector’s involved. EDGE is involved, and we’ve got a gentleman here who’s on the EDGE board. We’re going to ask him a little bit about that later on. All of those -- EDGE, by the way, is Economic Development Generating Excellence, and these are all very important parts of what’s come together to make Oklahoma what it is. And I promise you, we’re much different today than we were just two decades ago.

>> **Gary Owen:** Oh, yes, we definitely are.

>> **Steve Paris:** In a better way.

>> **Gary Owen:** All right. We’ve got time for a couple of quick science news story. Believe it or not, NASA says it is seeking friends for a new game. The US space agency launched on Facebook, the Online Game Space Race Blastoff, tests the players’ knowledge of the space program with multiple choice questions. Players can compete against others to play or play solo. It features questions such as, “Who was the first American to walk in space,” and, “Who launched the first liquid-fueled rocket?” Players who answer these questions correctly, gosh, they’re going to get virtual badges to picking NASA astronauts, a spacecraft and celestial objects. NASA says that the Space Race Blastoff opens NASA’s history and research to a wide new audience of people accustomed to using social media. So, you might want to research Space Race Blastoff on Facebook. Blind them with light, drench them with water, cannons or deafen them with sound blast. These are some of the onboard anti-pirate features that figure and a

project being developed in France. The project was presented recently to some 400 delegates in attending MARSIK -- MARISK. I guess that's right, MARIX, that's MARIS, MARISK -- MARISK. I can't pronounce it, M-A-R-I-S-K.

>> **Steve Paris:** That's easy for you to say.

>> **Gary Owen:** MARISK, a forum on shipping security in Western France. A series of traps and non-lethal defenses are set to be installed onboard the Partisan, a French military training vessel in a \$12 Euro project piloted by the French Environmental and Energy Management Agency. Researchers say that a professor from American University in Cairo says he's discovered a prostate cancer in a 2200-year-old mummy, which indicates the disease was caused by genetics, not the environment. And a new study released by Georgetown University Medical Center reveals that the part of the brain used for speech processing is in a different location than originally believed. And researchers say this new find will require -- are you ready for this, a rewrite of medical texts. And they're saying that yes, we're finding out this new find shows that well they're saying our -- this whole thing is a little closer to the auditory cortex, not behind. So, I don't know. It's -- I'm not going to go into the whole story because it's just too long to get into. And also, one other story I'd like up to you, Steve, you need to know this. You wonder why I drink black tea every show.

>> **Steve Paris:** Why is that?

>> **Gary Owen:** Well, some interesting findings from a research that a University of Western Australia found suggests that black tea can cut or reduce heart disease by ten percent. That's what they're saying. So, yes, it's hard to believe, but that's what they're saying. So, those of you who drink black tea, you're on a healthy path to maybe reducing heart disease. How about that? So.

>> **Steve Paris:** How about that?

>> **Gary Owen:** I'll tell you what, we're going to take a little break here in just a moment. And then you've got some interesting innovations in history. We kind of got on our opinion -- you know, our editorial --

>> **Steve Paris:** No, no, editorial.

>> **Gary Owen:** Well, not so [inaudible] but editorial [inaudible] I guess is a better way to say it. So, we're going to take a little break and then we're going to come back and talk to our guests and learn a little bit more about DNA solutions when we return on your Oklahoma Science Radio Magazine, *Oklahoma Innovations*, so stick around, a lot more to come.

[Music]

Hearing loss is not just a problem for the aging population, soldiers involved in explosions and weapons training are victims of noise-induced hearing loss. Facing mounting disability expenses, the Office of Naval Research provided funding to an Oklahoma researcher to help identify a treatment for noise-induced hearing loss. The solution, a pill that could reverse damage to your hearing. With the support of the Oklahoma Center for the Advancement of Science and Technology, Oklahoma researchers have been testing combinations of chemicals in an effort to create a treatment that is as easy as swallowing a pill. OCAST is looking for Oklahoma researchers serious about investigating new products, services and processes that improve the

quality of life and the economy for Oklahomans. For more information, call OCAST toll-free at 866-265-2215, or visit our website at ocast.ok.gov.

[Music]

Now in its 16th year, this is *Oklahoma Innovations* on the OCAST Radio Network.

>> **Gary Owen:** We appreciate you joining us this week on *Oklahoma Innovations*, and we're going to be talking about some genetic level science here today. But before we get started, because we highlight this feature of our show, and sometimes we get -- we cut you a little short, but it's time for our Innovations in History.

>> **Steve Paris:** Thank you, Gary. You know, it was on February 1st of 1793, Ralph Hodgson of Lansingburg, New York.

>> **Gary Owen:** See, your mouth's not working either.

>> **Steve Paris:** No, it's not.

>> **Gary Owen:** I don't feel bad now.

>> **Steve Paris:** Patented -- but Ralph patented it one of the world's greatest innovations. It was called, "oiled silk." Hmm, we need to check into that, see what that was all about. February 2nd, 1892, William Painter of Baltimore, Maryland patented the crown cork bottle cap. Leonard Keeler conducted a test of the polygraph, the lie detector machine, on February 2nd, 1935 in Portage, Wisconsin. It marked the first time that one of the mysterious boxes was used. You know, I don't think I would ever subject myself to that.

>> **Gary Owen:** Well.

>> **Steve Paris:** Don't trust those things. It was February 4, 1895 when the first rolling lift bridge opened over the Chicago River on Van Buren Street in Chicago. The bridge uses steel tresses or girders across the navigable channel supported by and originally connected to large steel rollers. Its curved steel bases like a rocking chair rockers weighed in the rear to counterbalance the span to open. The bridge rolled back on its rockers until upright like a jackknife. And on the same date in 1957, Smith Corona Manufacturing Incorporated New York began selling portable electric typewriters. What's a typewriter?

>> **Gary Owen:** Still have one of those?

>> **Steve Paris:** What is a typewriter?

>> **Gary Owen:** Well, some people do.

>> **Steve Paris:** The first machine was a portable of 19 pounds. Soon other manufacturers offered similar models made of lighter weight plastics with a lot less of the sophisticated workings inside. And that, Gary, is Innovations in History for this week.

>> **Gary Owen:** You know, I see some old vintage footage of people working in offices with those Selectric Typewriters and the early electric typewriters and go, "Really, I can't believe we really worked on those things." You know, [inaudible] wouldn't know what this is today. Kids will look at that today and go, "What is that?"

>> **Steve Paris:** Yes, I know.

>> **Gary Owen:** All right. We're going to talk about DNA. Why don't you and other genetic -- biochemistry I guess is probably -- wouldn't that be a better generic label?

>> **Steve Paris:** We're going to let the gentleman who knows what we're talking about talk about that. And that's Thomas Kupiec, Dr. Thomas Kupiec, president/CEO -- he's got three companies. Yes. I'm going to let him talk about those. We also have with us Dr. Brandt Cassidy. And he's the laboratory director -- director of the laboratory in one of these companies, right, or all of them.

>> **Brandt Cassidy:** DNA Solutions.

>> **Steve Paris:** DNA Solutions; that's what I was thinking. Okay. But first we'll go to Dr. Kupiec. Tom, tell us -- before you get into this, tell us a little bit about who you are and how you have been involved in the R&D industry for quite some time in Oklahoma.

>> **Tom Kupiec:** Well, thank you, Steve, and thank you for inviting us today. It's a pleasure. We have great admiration for the OCAST and the EDGE and [inaudible]. And the facilities are going on, the mechanisms that are occurring in the state right now for funding, technology and commercialization. A little bit about me, I'm a scientist that's turned entrepreneurial. I didn't know how to spell "entrepreneurial" initially. We started out with three employees back in 1998, and we now have over 50 employees; and this divided among three companies. The first company was Analytical Research Laboratories or ARL BioPharma. And it is a pharmaceutical testing company that specializes in pharmaceutical end product testing. And we test mini-compounded products. We test mini-pharmacy products, hospital pharmacy, as well as big pharma. And that's involved in all stages of the analysis. The second company is DNA Solutions. It's a genetic testing company, and that's headed up with a Dr. Cassidy, our laboratory director. And he was actually one of the founders that started -- initiated the Alma Noble Foundation, that great institute down in Ardmore. And then the last five years we created a third company, which is really more knowledge-based, and it's a forensic think tank. It's the Kupiec Group. And we do a lot of unusual death investigations, specializing in toxicology and other areas. So, we have a pharmaceutical or chemical testing company, which is ARL. We have a genetic testing company, which is DNA Solutions, and then the knowledge-based company, which does a lot of consulting and litigation support and affidavit and depositions in the area of forensics.

>> **Steve Paris:** So, you get involved in a lot of the things like we see on -- well the more recent versions of Perry Mason and that kind of stuff on television, right; all that cloak and dagger kind of thing. We'll let...

>> **Gary Owen:** You look at way too much TV.

>> **Steve Paris:** ...you talk about that more in just a little bit, but I want to introduce Dr. Brandt Cassidy, who's the director of laboratory work at your companies -- with DNA Solutions. And Dr. Cassidy, tell us a little bit about how you came to be involved with this guy.

>> **Brandt Cassidy:** Well, thank you very much. I appreciate the opportunity to be here, and I'm a scientist as well. Developed my career through a PhD in Pharmacology from Baylor College of Medicine in Houston, Texas. I ended up working as a plant scientist at the Noble Foundation in Ardmore.

>> **Steve Paris:** We're familiar with them.

>> **Brandt Cassidy:** And I was there for nine years doing research on plant viruses actually. And a group of people thought it would be interesting to start a company to do DNA or genetic analysis. And I had a long history of identifying DNA fragments in plants and animals, people as well. So, we started this company in 1998 in Ardmore, with the help of Rural Enterprises of Oklahoma and the Ardmore Chamber of Commerce.

>> **Steve Paris:** Wow.

>> **Brandt Cassidy:** And they really supported us and got us off the ground.

>> **Steve Paris:** Our good friends [inaudible].

>> **Brandt Cassidy:** Absolutely; great people.

>> **Steve Paris:** You bet.

>> **Brandt Cassidy:** And so then Dr. Kupiec felt like it would be a good addition to his plan for developing companies to do this type of testing and purchase DNA Solutions. And we remained in Ardmore for another four years, up until 2004, and then we moved to the Research Park, which is a fantastic facility for growing businesses.

>> **Steve Paris:** Um-hum. Now, you're talking about the Presbyterian Health Foundation, PHF.

>> **Brandt Cassidy:** That is correct.

>> **Steve Paris:** And I've forgotten how many people are there, but there's something like 50 or 60 companies, technology-based companies that are there, and you all have -- I guess all three of your firms there now, Tom?

>> **Tom Kupiec:** Yes, sir.

>> **Steve Paris:** All right, very good.

>> **Tom Kupiec:** Well, we work with a lot of those companies. It's been a great opportunity.

>> **Steve Paris:** Okay. We've got a minute in this segment. This is a shorter segment. I want to ask you, Tom, about EDGE, Economic Development Generating Excellence. You're on the board. Talk to us about that.

>> **Tom Kupiec:** Yes, sir. EDGE is an incredible program. I think it's unique. It's different from OCAST and it has a little bit -- it's more of a whiteboard. You can -- it's really the intent is to commercialize technology. You know, I like it because it's a great group of people. The state has really put together a good program here. It's a nonpartisan. I like it. It's promoting the entire state rule versus urban, all aspects of it. And it encourages a collaboration between the universities, toward private companies like ours, as well as nonprofit companies like OMRF, Nobel. I mean, the state is very fortunate to have a lot going on in the areas of the sciences. And there's a lot going up in the northeastern part with Tulsa, the Health Science Center there, the LSU, just a -- Stillwater LSU. There's just incredible opportunities.

>> **Gary Owen:** Okay. We're going to talk more with Dr. Kupiec and Dr. Cassidy. And let's get more into this DNA stuff.

>> **Steve Paris:** Oh, that's interesting interview.

>> **Gary Owen:** I'm really fascinated with that.

>> **Steve Paris:** Yes.

>> **Gary Owen:** When we return on *Oklahoma Innovations*.

[Music]

This is Oklahoma Science Radio Magazine, *Oklahoma Innovations*, with Gary Owen and Steve Paris, on the OCAST Radio Network.

One man's trash is another man's treasure. That's the motto that led one Oklahoma company to take waste from oil and gas and turn it into a commercially viable product that's pumped over \$2.4 million back into the local economy. The company has developed a process to extract iodine from the waste that is created when oil and gas are pumped from the earth. Iodine has many uses, including in electronics, such as plasma screens, and in your daily diet in the form of salt. Because OCAST provided seed funding to test the technology, an international company chose to build their iodine extraction plant in rural Oklahoma instead of their original plan of building in a foreign country. OCAST is looking for Oklahoma researchers serious about investigating new products, services and processes that include the quality of life and the economy for Oklahomans. For more information, call OCAST toll-free at 866-265-2215, or visit our website at ocast.ok.gov.

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Research and development, technology transfer and commercialization, creating high-paying jobs in Oklahoma is what OCAST is all about. This is *Oklahoma Innovations* on the OCAST Radio Network.

[Music]

>> **Gary Owen:** We're talking with Dr. Tom Kupiec and Brandt Cassidy, and they're with an organization that's ARL DNA Solutions. And we thought we would take this segment to give our audience just kind of quick overview of some of the sciences involved with DNA Solutions. And there are four aspects of your company. Why don't you talk about that?

>> **Tom Kupiec:** Yes, sir, Gary, thank you. We actually have -- the four areas that we focus on is human testing, and Dr. Cassidy could explain a little bit more about both of the aspects of the human testing. We actually specialize in animal testing, as Dr. Cassidy mentioned earlier, from the Noble Foundation they do a lot of work with agriculture, and which is the area we want to go in the future with food safety and animal safety. Diagnostics is one of our key areas that we're exploring, both genetics predisposition and maybe perhaps clinical diagnostics. And the last one, which is exciting to everyone, is the forensics and research development.

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

>> **Tom Kupiec:** Actually, both companies, ARL or the Analytical Research Laboratories actually started a new division this year in 2012 of research and development of projects so.

>> **Gary Owen:** And there's no question that forensics DNA scientists changed the criminal justice system a lot in the way they look at cases now, hasn't it?

>> **Steve Paris:** That's very true.

>> **Gary Owen:** Because of the way DNA science has come along, because it's faster, you've gotten new methods of processing DNA now, and they go back and look at some old cases and those kinds of things. So, talk about the human testing.

>> **Steve Paris:** That would be Dr. Cassidy, and I have a specific question. I know at -- you know, where you were before down at Ardmore, a lot of the scientists down there spent time dealing with tobacco plants because of their standardized kind of a DNA sample that they provide. I don't know if you worked in tobacco plants or not.

>> **Brandt Cassidy:** Yes. We use them as a model.

>> **Steve Paris:** As a model, right, and that's not -- and please don't understand that doesn't mean you're trying to promulgate more tobacco. That's not what that means at all. It's just that the tobacco plant has some unique qualities as it relates to DNA to make them good in the laboratory. Now, having said that, you have transferred what you've learned and what you've studied over into humans; is that right?

>> **Brandt Cassidy:** Well, and I worked in humans for my PhD project.

>> **Steve Paris:** Did you? Okay.

>> **Brandt Cassidy:** And so it's fascinating that when you look at the DNA level of any organism, there are unique elements to everybody's DNA.

>> **Steve Paris:** Right.

>> **Brandt Cassidy:** Although we're 95% identical at the DNA level, it's that extra 5% that makes us unique so you don't look like anybody else, unless you have an identical twin, then you do share 100% of your DNA. But everyone else has got a unique DNA profile and it's true in the whitetail deer that we work with, in the cattle industry that we work with, even in plants. They're DNA typing marijuana plants so they can track where these plants may have come from and been propagated. So, it's the unique ability to identify bits of DNA that are -- will give you a fingerprint of that particular organism that allows us to do what we do.

>> **Steve Paris:** Let's talk about the forensic side. Talk to us about some of the cases you worked on and what you've been able to bring to the table.

>> **Brandt Cassidy:** Well, we do work in human forensics, and just like CSI and all of those, where we take little tiny bloodspots and develop profiles and identify who they match to.

>> **Steve Paris:** Probably takes you a little longer to do it than a 45-30 minutes or so, yes.

>> **Brandt Cassidy:** Very true, very true; it does.

>> **Steve Paris:** Okay.

>> **Brandt Cassidy:** But we do not have a big backlog as some of the crime labs do, so we're able to process things a lot quicker. But our unique ability is to work in animals, and one of the things I really like is that we've developed specific markers for whitetail deer, for mule deer, for cattle that we can use to identify, uniquely identify, individual animals. And this allows us to participate with law enforcement and support their efforts to catch criminals. And this involves anything from animal theft, which I was involved in a case in Pennsylvania, where an animal went missing from -- a whitetail deer that in 2003 had the largest set of antlers in North America.

>> **Steve Paris:** And so there would be some interest in promulgating that particular animal.

>> **Brandt Cassidy:** Absolutely. This was going to be a breeder deer, and the owner came home, the fence had been cut, the deer was gone. And so he put a reward out and they couldn't find it. Eventually, somebody saw a deer that looked just like his four years later...

>> **Steve Paris:** Oh, my.

>> **Brandt Cassidy:** ...with a huge rack on its head and said, "I think that's your deer." So, we were able to do DNA analysis to prove that that was indeed the same deer that was on his place four years earlier. And we went to trial and the guy was found guilty of possession of stolen property.

>> **Steve Paris:** Wow. So, law enforcement in Pennsylvania knew to call Oklahoma to find the people who could do the -- who could verify that.

>> **Brandt Cassidy:** Right; we're one of the very few in the nation that actually specializes in this type of analysis.

>> **Tom Kupiec:** You might mention how much that one was estimated to cost.

>> **Brandt Cassidy:** Well, the value was placed at over half a million dollars...

>> **Steve Paris:** Oh, wow.

>> **Brandt Cassidy:** ...on that particular animal.

>> **Steve Paris:** So, there was good reason to investigate it.

>> **Brandt Cassidy:** Definitely.

>> **Steve Paris:** Do you ever get involved in issues that impact Homeland Security, because I know our food supply -- and as you talk about, you know, livestock production and other things -- and maybe that's something to come, but --

>> **Brandt Cassidy:** Well, food safety is very important, and one of the cases that we did work on was a sting operation with the USDA. They require anyone who's selling beef to the public to have a USDA inspect it.

>> **Steve Paris:** Right.

>> **Brandt Cassidy:** Well, this particular shop was buying animals that had some physical defects so they weren't able to be USDA approved. They were buying them and then selling them in their shop to the public. So, the USDA came to us and we collected samples of these two cows that they were going to put in the sale, and the sale went as expected, and they tracked this animal to this guy's shop. And then they went and they bought beef out of his case, and we were able to match the samples from the cows before they were butchered to the meat in the freezer at his shop.

>> **Steve Paris:** Wow.

>> **Brandt Cassidy:** And they were able to shut him down and put him in jail as well for not following the processes.

>> **Steve Paris:** Yes; and in food supply, the safety of our food supply, not only as it relates to terrorism, but as it relates to domestic theft, is very important.

>> **Brandt Cassidy:** Absolutely; and cattle wrestling is still a huge issue...

>> **Gary Owen:** It is.

>> **Brandt Cassidy:** ...in Oklahoma and Texas, and we work with the Texas Southwest Cattle Raisers Association, and we can catch people that have stolen cattle from particular places.

>> **Steve Paris:** See, Gary, I bet you never thought that this interview would go in that direction as we talk about DNA and how to evaluate -- how to track animals in -

>> **Gary Owen:** I'll tell you what really interests me too. You know, you were talking in the early part of the program about how companies grow by using -- obviously OCAST is a partner, but then you're getting into federal funding and so forth. And Dr. Kupiec, your companies obviously attracted federal and state funding, and that's what's contributed to your growth, right?

>> **Tom Kupiec:** Yes. We're very fortunate because we've participated in all aspects of OCAST with our TBF funding. We've received [inaudible] -

>> **Steve Paris:** I'm going to explain that, Technology Business Finance money. So, TBF, a lot of folks out there won't know what that means.

>> **Tom Kupiec:** And we also -- you were talking about receiving dollars from the Department of Defense or Federal Homeland Security. Early on we did work with gene expression, and our companies worked closely with Oklahoma Medical Research Foundation, Dr. Mike Centola and his group there at OMRF, and I think our success has been -- we've been associated with really great minds and really good people in Oklahoma. And that's -- I think the success has been connecting with other companies, nonprofit companies, universities, and then working together as a team. Majority of our dollars come from outside of Oklahoma and probably 98% of our revenue generated at all of our companies is outside of Oklahoma and bringing it into Oklahoma.

>> **Gary Owen:** And that is an aspect we've not talked about, but that is an excellent thing to have. We love money from Texas and Pennsylvania and other places, don't we?

>> **Steve Paris:** Exactly; from Texas.

>> **Gary Owen:** You bet you, get all the money we can from Texas. No, no. We've got friends in Texas. We work with them too. Well, that's a good point, Tom, the -- as you talk about the collaborative aspect of it, you and Dr. Centola working together. You've got some other companies there -- and we're going to run out of time if we don't get them in there; ARL, that's number one. I mean, that's the first one, Analytical Research Labs. Talk about that.

>> **Tom Kupiec:** ARL is actually an exciting company. You're right, it was the first one that we worked with. It started out testing products for compounded medication, which is a prescription that's prescribed if it's not commercially available. So, it's that physician-patient-pharmacist triad. And with developing to do it, do it right, we put a lot of revenue and resources into quality. Our companies -- both companies, ARL and DNA Solutions are ISO17025, which is a

measurement of the technical competency. It's a national -- international standard for technical competency that looks at measurement of uncertainty, independent proficiency samples, and a variety of other matters. But our services, we really do a lot of unusual but basically drug testing. We've worked with companies like M.D. Anderson, a lot of hospitals on the East Coast, West Coast, in the area of drug, drug development. And then we do a lot of quality control, and then we bring in the forensic aspect. So, my background we're working as a forensic chemist at the Oklahoma City Police Department, as well as working at the Federal Aviation Administration Toxicology Laboratory, has brought a different slant to it. So, my doctorate's in pharmaceuticals there at the Health Sciences Center at the College of Pharmacy, but bringing the influences of forensic toxicology. And it's just sort of -- the diversification and the variety has lent itself a positive combination; and then incredible people. We have the very best employees. That's what makes the company, it's the -- it is the people that makes the companies.

>> **Steve Paris:** Absolutely; and you've had the privilege of picking some pretty darned good folks out there.

>> **Tom Kupiec:** Oh, they're top, they're top.

>> **Steve Paris:** You bet.

>> **Gary Owen:** I love their position statement. Are you ready for this? Hit me: Truth Through Science.

>> **Steve Paris:** Wow.

>> **Tom Kupiec:** Oh, that's the mantra for the Cubic Group, which is the third company.

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

>> **Tom Kupiec:** Reveal -- it's actually, "Revealing Truth Through Science."

>> **Gary Owen:** Um-hum. That's awesome. All right. Well, I hope you -- our audience are intrigued by this company based in the Presbyterian Health Foundation Research Center in Oklahoma City. It's really close to the state capital area down there. We'll be back and talk more with our guests when we return on *Oklahoma Innovations*.

[Music]

There's more to learn on *Oklahoma Innovations* with Gary Owen and Steve Paris on the OCAST Radio Network.

We've all heard the old adage, "When life gives you lemons, make lemonade." Well, when life gives you Eastern Red cedar trees, make mulch. These invasive trees are not a welcome sight for Oklahoma farmers and ranchers because they displace plants, can accelerate a spark into a catastrophic wildfire, and are expensive to remove, but a new market for these Red Cedars could turn them from dangerous nuisance to profitable resource. With the support of the Oklahoma Center for the Advancement of Science and Technology, one company is researching how to transform these invasive trees into productive esthetically pleasing garden mulch that pays for the cost of its own removal. Creating solutions, supporting innovation, that's what OCAST is all about. OCAST is looking for small business owners serious and investigating new products, services and processes. For more information call OCAST toll-free at 866-265-2215, or visit our website at ocast.ok.gov.

[Music]

>> **Gary Owen:** It's about science, technology, commercialization, education. We talk about it on this program every week when we bring you interesting guests from around the state who are involved in a variety of aspects that link business and the lab together, education to the labs and to business. It's a fascinating show we've been doing, as you hear all the time now, 16 years, Steve and I, are always exciting about coming to the studio and learning something new. And this is a perfect example.

>> **Steve Paris:** Oh, it is, it is. And I learn something every time I interview these folks. But Dr. Kupiec was talking before we went into the break about -- you mentioned the FAA and some of the work that your company has done with them. And you told me -- I need to ask this --

>> **Tom Kupiec:** Well, no, no we haven't done with them. I mentioned I worked for them.

>> **Steve Paris:** Okay, okay.

>> **Tom Kupiec:** We've done similar type work with the medical examiner's office, I mean investigations and airplane accidents. But FAA has an incredible forensic toxicology lab, which has really given me the foundation.

>> **Steve Paris:** Okay. I didn't mean to -- did not mean to explain that improperly. But you also directed me to Dr. Cassidy on the specifics of some of that research work. And you talked about the airplane accident that you set up and, I mean, nobody was hurt, I mean, I would assume. This was a test, or maybe they were.

>> **Tom Kupiec:** No. This was an actual...

>> **Steve Paris:** Oh, a real accident.

>> **Tom Kupiec:** ...plane crash, right, right.

>> **Steve Paris:** Okay. Talk to us about that, the services you provide.

>> **Tom Kupiec:** I was at Wiley Post and there were a number of individuals on the plane, and the investigation led to being able to identify that there were only that number of people on the plane. And so we used their unique DNA profiles from the evidence that was collected from around the plane crash zone, which was a quarter of a mile zone where things had been spread.

>> **Steve Paris:** Wow. When was this?

>> **Tom Kupiec:** This was five or six years ago. A corporate jet went down and so we were able to -- well the medical examiners collected all the stuff they could and we were able to help them sort it so that the individuals could be returned to their loved ones and they could have services for them. So, we were able to use our unique DNA testing abilities to do that.

>> **Steve Paris:** Wow, fascinating. Want to mention something briefly that you just said. You have a son who is a product of OSSM, right?

>> **Tom Kupiec:** That is correct.

>> **Steve Paris:** Yes.

>> **Tom Kupiec:** He graduated last year.

>> **Steve Paris:** The Oklahoma State School Science and Mathematics.

>> **Tom Kupiec:** That is correct.

>> **Steve Paris:** You bet.

>> **Tom Kupiec:** It's quite an impressive facility.

>> **Steve Paris:** It's hard to get in there. They told me I couldn't go. No, I'm just joking. No way I would apply for that; nor am I young enough to ever even have thought about it. But I want to get back to some of the things you're getting ready to do, Tom. You talk about clinical diagnostics. You all some work for the Oklahoma Blood Institute. And this is just scratching the surface I know. Talk to us about that.

>> **Tom Kupiec:** Well, both companies -- actually all three companies is growing and we've really been blessed and had continual growth over the past ten to 12 years. From the Analytical Research Labs we've created a new division called, "research and development projects." We're doing more and more work with federal and state institutions, and we're looking at doing different types of research and development for drug and drug development. And then the DNA copy we're looking at developing and growing it, and so we're -- from the innovation perspective, we're trying to introduce a new product or service, and one area specifically we're looking at is the diagnostics. And maybe as you think futuristic, where we may be in five to ten years, it's really -- I would love to say we could tell you, but we really don't. It's really --

>> **Steve Paris:** It's kind of hard to know at this point.

>> **Tom Kupiec:** It's been an interesting journey, and it's been evolving, and a lot of times information or ideas are revealed as you get -- open the door and get in, and then another direction would go. And I think it's being there at the right place and then capitalizing on those opportunities from a scientific perspective. And Dr. Cassidy can tell a little bit about where we're looking to go for some of the diagnostics, as well as maybe some of the pharmacogenomics, which has really personalized medicine. I think that is a way of the future.

>> **Gary Owen:** Did I read, then, in your bio that Dr. Craig Shimasaki is a consultant in your business?

>> **Tom Kupiec:** Yes, yes, Dr...

>> **Gary Owen:** Because I know he's involved in a lot of that kind of thing.

>> **Tom Kupiec:** ...Shimasaki works for several -- all of our companies as a consultant.

>> **Gary Owen:** He's been a guest of ours for off and on so.

>> **Tom Kupiec:** He's a very sharp man.

>> **Steve Paris:** Yes, he is.

>> **Gary Owen:** Um-hum.

>> **Tom Kupiec:** And it is great to be associated with him.

>> **Gary Owen:** Okay.

>> **Brandt Cassidy:** Yes. That's the exciting part is the future and my being able to spend time to develop new things. That's what really appeals to me in the science aspect, being creative.

>> **Gary Owen:** You know, one thing we haven't talked about is how technology has affected your industry, because the tools that you use are changing and improving, computers and all the

other equipment that you -- talk about that for a moment because I know that helps in speed, in accuracy and those kinds of things.

>> **Tom Kupiec:** Oh, absolutely. There's a continual flow of new technology and trying to identify what's going to be -- going to help you and your bottom line especially, because a lot of that technology is very expensive.

>> **Gary Owen:** Very expensive.

>> **Tom Kupiec:** And so you have to know that that's going to be the direction that you want to go. But we do -- each year in the past several years we've purchased probably \$80,000 worth of material -- of equipment that's put into place for robotics or a new type of technology. One that we just got was a quantitative PCR machine. So, these are things that allow us to move forward and develop these new [inaudible] to do human diagnostic testing really rapidly, which -- well a test that used to take a week we can do in a couple of hours now.

>> **Steve Paris:** Dr. Cassidy, you know, you've talked about some of the new things, new approaches that have been developed, and I was listening to Dr. Kupiec talk about all the different things. Don't really know where you're going exactly until you kind of open that door and see what the needs are. But as I have read down the list of services that are provided by your three companies it occurred to me I would describe your company as one being very agile, prepared to make changes, prepared to engage. And is that a freedom that's I guess fostered among all the staff at these three firms?

>> **Brandt Cassidy:** Well, absolutely. I would say that is definitely. We solicit input from everybody in the lab if they can find a better way to do something or see new technology that's going to help -

>> **Steve Paris:** Give them the freedom to do so.

>> **Brandt Cassidy:** Absolutely.

>> **Gary Owen:** You know, Steve, here's a unique model that we talked about at OCAST. A lot of times they look at scientists and business people as two separate entities. Sometimes scientists aren't the best business people and vice versa. And here Dr. Kupiec, you have been quite innovative in your business model, and you've grown three companies now. You know, when you started out, did you ever think that you would be this far?

>> **Tom Kupiec:** Oh, no, there's no way. And I still -- it still is hard to believe. I mean, it's, you know, you wake up -- we -- there's a lot of effort. I mean, let's be real.

>> **Gary Owen:** Oh, sure, it takes a lot of hard work.

>> **Tom Kupiec:** There is a tremendous amount, but I think literally it's the people, people like Dr. Cassidy, Gary Cook, he's been very active in the development with the relationships of our deer farmers. We've brought in Greg Thomas how used to be at [inaudible]. We had really sharp bright people that my goal is to provide the rider and sort of now get out of the way. But it's really interesting. I remember when we started out it was out of the SBA. There's a group that -- SCORE was the program, Senior --

>> **Steve Paris:** Oh, yes, SCORE.

>> **Gary Owen:** Um-hum

>> **Tom Kupiec:** You know, I don't know, do they still have score?

>> **Steve Paris:** Yes, they do, yes.

>> **Tom Kupiec:** I remember --

>> **Steve Paris:** Small Business Administration and SCORE Program is executives -- people who have expertise who have retired and now provide that service.

>> **Tom Kupiec:** I'll never forget, the original start I would meet every Friday at 9:00 with a gentleman by the name of Tim O'Dowd, and Tim was an attorney and very bright. I would meet with him at 9:00 and write everything he said down and just take it in like a sponge. And I think there's a lot of tools here for Oklahomans that do want to do business and business development, and really capitalize and work with those. And I think an idea is don't put it in a box, but think outside and say...

>> **Gary Owen:** There you go.

>> **Tom Kupiec:** ...take the good, verify or collaborate with others. I know ITE has been an incredible support and offers a lot of opportunities for new businesses. And they were very good to ARL and DNA Solutions through this process as we look. And just basic things of payables and receivables which does not come naturally to someone like myself as a scientist. But I think it is paying attention to detail. We have an incredible quality person, Tommy Mains, he heads up our quality. And if you look throughout the company, it's just sprinkled. I mean, Maria Ingle, she is from the Oklahoma City Community College of a biotechnology program that's been nationally well-known and started out by Charlotte Mobile. And now it's being carried on. And it's really interesting to see the people that's been sprinkled and we've been fortunate to have to come through out paths.

>> **Gary Owen:** Guys, I want to give some contact information while we have a few minutes in the program. Is it all one entity of a website wise, or do you have two separate websites?

>> **Tom Kupiec:** They're actually -- it is three separate entities, and Analytical Research Labs is www.arlok.com. And then DNA Solutions, which is a separate genetic testing company is just held similarly, it's www.dnasolutionsusa.com, because there is a DNA Solutions in New Zealand when we -- and so we wanted to separate ourselves. And it is a plural dnasolutions.com.

>> **Gary Owen:** Fascinating. We've got a minute left, Steve.

>> **Steve Paris:** Okay. And that would take me to the Kupiec Group. We've talked a little bit about it, but not in any great depth. You've got less than a minute to talk about the Kupiec Group.

>> **Tom Kupiec:** The ultimate goal for the Kupiec Group is that it's a think tank of really bright minds like Dr. Cassidy, Dr. Phil Kenneth has worked with us, many scientists throughout the company. Actually, I'll be leaving today going to a courtroom testimony on a case this afternoon. But it's really -- the mantra is, as we stated earlier in the program, "Revealing Truth Through Science." And we're not a hired paid gun, and many times we are not giving the individual -- the attorneys or the individuals will be consulted for patent litigation, and many times people will retain us to see what is the truth. And it may not be in their favor, but then they will have questions on how to defend it. So, most of our clients are attorneys. And it's as many out of the state as there is in the state. Many of our clients are on the East Coast in DC, Chicago, New York, Seattle, LA. We work on many different types of cases.

>> **Gary Owen:** Wow.

>> **Steve Paris:** And this is a company that -- folks, I just want to say, as you're driving down the highways and the streets of Oklahoma, know...

>> **Tom Kupiec:** It's at PHF Park. It's the Presbyterian Health Foundation.

>> **Steve Paris:** ...these gentlemen may be driving beside you.

>> **Gary Owen:** We've got to go. Thank you very much. See you next week, Steve, on *Oklahoma Innovations*.

[Music]

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