Oklahoma Innovations Radio Show

Air Date: November 7-8, 2015

Guests: **Jason Sanders**, **James Tomasek** and **Judith James**, University of Oklahoma Health Sciences Center (OUHSC)

>> 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:** Thank you Andy and welcome, Gary Owen and Chad Mullen from OCAST. Glad to have you along this week on *Oklahoma Innovations*. We are coming to you this week from the OU Health Sciences Center, and we've done a few shows from OU Health Science Center. We have some interesting guests this week. Chad, welcome to the microphone this week. Tell us a little bit first of all before we get out guests on, about what we need to talk about as far as OCAST.

>> **Chad Mullen:** Gary, thanks. We've got a couple things exciting going on at OCAST but the one thing I want to make sure that we mention is, November 16th, we're holding our regional innovation forum in Durant, Oklahoma and it's going to be held on the campus of Southeastern State University, Oklahoma State University, and visit our website, OCAST.ok.gov and you can find links to register there. We're going to have many of the economic development leaders in the area. Folks from Academia, folks from the Venture Capital, and R & D Investing entities in Oklahoma City are going to be there. Our Lieutenant Governor, Tom Lamb is going to be our keynote at lunch. So, we're excited to have him joining us as well. So, November 16th, Southeastern State University in Durant. Visit OCAST.ok.gov and with that Gary introduce our great guests. We got a great panel.

>> **Gary Owen:** We have a very impressive panel of guests here. First of all we have Dr. James Tomasek. He's Vice President for Research. Dr. Jason Sanders, who's an Interim Senior Vice President of Provost. Is that right? I want to make sure I get all these titles correct. And then, we also have Judith, Dr. Judith James. She's Associate Vice of Provost for Clinical and Translational Science. Boy, that's a mouthful. Wow. So, we're going to find out what that's about later. So, the reason I think we've brought this panel together Chad, correct me if I'm wrong here, is to really educate the audience a little about the importance of the research that's going on here at OU Health Sciences Center.

>> **Chad Mullen:** Yeah, absolutely Gary. I think there's OU and OMRF, so the University of Oklahoma Health Science Center and Oklahoma Medical Research Foundation are housed on the same campus here in Oklahoma City and they do research and commercialize some of that

research that really effects the lives of people, not only in this city and state but around the nation and around the world. And, the folks that we have here today are doing just that and also, we'll get to Dr. James here in a little bit who will talk about some of the work they're doing that can actually impact rural Oklahoma as well. So, we're very excited about that. And, first off, I'd just like to introduce Dr. Sanders and Dr. Tomasek and welcome to the show. Gentlemen, thank you for being here and tell us a little bit about what's going on here on the campus of OUHSC, especially as it relates to research and development.

>> **Jason Sanders:** Well thank you very much, it's a pleasure to be hosting this show and speaking to all your listeners. As you said, we really take very seriously all of our work in research and how unique of resource it is for Oklahoma. As you mentioned here at the Health Center we have a significant [inaudible] of researchers, really appreciate our partners with Oklahoma Medical Research Foundation, other companies, The Research Park, OCAST, agencies like I2E, it's a long list and we consider ourselves to be an important part of that network and our research priorities are something our full leadership team constantly evaluates and we'll share a little bit more in the program some of our thinking on priorities and I want to highlight again, how pleased I am with Dr. Tomasek and Dr. James. Real leaders here at the health center for many decades both as investigators driving forward research. Also in our leadership team because we've realized that as our systems become more complicated and resources are so precious, and so competitive that we get that we need real leadership in our research and administration to work with our faculty, design our environment and systems. So, thank you for hosting this today.

>> **Gary Owen:** You know I think a lot of people who come and visit this campus think of this as a medical campus, and I mean that from a patient's perspective, or the average person out there comes to have a visit for what, for a specialist. They come here, they don't' realize that behind the scenes there's really a lot of important research in a lot of areas of medicine here. Can you elaborate a little bit about that?

>> **Jason Sanders:** Yes, it's a real privilege to serve the patients in Oklahoma and I'm in clinic as well as a clinician and people drive 50 miles away, 100 miles away as they really look to us as a resource and where we feel that we are distinctive, that academic health centers across the country are distinctive, as in bringing research based medicine. Not only as utilizers of it but as developers of it. And we run all the way from fundamental, biological discoveries. I think we'll talk about the Nathan Shock Center at some point in the program. Through our translational research where Dr. James has been a real leader to our clinical trials, and also just to highlight from those patients perspective. An individual patient comes here to the medical center but they often, during their care will ask, you know, why is this happening to me? But, even broader than that, why is this happening to my friends, my family? Why is this happening in my community? Diabetes would be an example of that. And so, we also do research in population health. It is true, some of our laboratory work, or the nature of the work is done behind the scenes from where patients are but, I think a program such as this, and just opening our doors as a community we want people to learn more about what we're doing. So, we appreciate this opportunity and we are trying to bring more of it more visibly to patients. I think some of our centers on campus such as the Stephenson Cancer Center, patients can really see the integration of our research in their medicine. For example, in our chemotherapy and infusion unit, as they meet with clinicians and researchers and they're working hand in hand on clinical trials.

>> **Gary Owen:** You notice Chad, I don't know if you were noticing the Bio, there's also a lot of technological innovation going on here. For example, the SIPCC device helping babies who are now unable to crawl, as kind of -- that's what we're going to learn about that later on in the show but, you may want to touch base on that. That was pretty cool.

>> **Jason Sanders:** We're very excited about that for a number of reasons. First of all it has an impact. I've been able to observe families and their infants using this. It's a device, an idea, an invention to help a young infant to assess the way that their motor development is, the way their brain is connecting with, you know, their muscles. They try to walk or to crawl and it looks at both infants are developing typically but also as infants who, unfortunately have cerebral palsy or other developmental delays. And, it not only is an assessment for families who may be very anxious. The family I observed had a child who had been born prematurely and they weren't sure yet from the typical milestones how that infant was progressing but, also for those infants who aren't developing typically, it's actually an invention that helps them learn to crawl faster. And this was recognized just recently by the Smithsonian as one of 13 inventions across the entire country this year that was showcased, and it's also a collaboration between Allied Health and Engineering with this type of interdisciplinary research that I think we uniquely bring here at the health science center.

>> **Gary Owen:** And to kind of elaborate on that a little bit for our folks at home when you talk about between Allied Health and University, we're actually, you have physicians here on campus at OUHSC in Oklahoma City and then the engineering support for the device was from the OU Norman Campus, largely.

>> **Jason Sanders:** Exactly.

>> **Gary Owen:** Is that right and are there other examples of that type of activity going on where you're kind of bringing in maybe more the engineering or some of the other sciences that are housed in Norman, happening, and then bringing them in to the Health Campus as well?

>> **Jason Sanders:** Yes, we're collaborating now and we're working aggressively to promote that collaboration in the future. I talk more broadly about biomedical engineering. We have a new investment from Philanthropy about the Goggli family and the Stephenson family and the School of Biomedical Engineering and they're working closely with our Cancer Center. They're working closely on such things as imaging, as Nano medicine for drug delivery, faculty-faculty collaboration, leadership collaboration across the University is our work as administration to enable those partnerships. I'd even mention something maybe a little different that our listeners may not think about, but I think in terms of what the University brings, our College of Business brings, significant value to our enterprise. Already a very successful professional NBA program here in Oklahoma City, building upon the program in Norman, and we have teams of students who, for a number of years, have worked with companies in terms of developing products, developing ways to commercialize technology and a lot of our expertise in office and technology development has a lot of synergy with our overall strategic plan with the University and economic planning. So, I think that's another good example of collaboration and we've talked with College of Business and Dean Pullin about additional ways, here in Oklahoma City, we can bring that expertise. I really kind of a network effect, convener, that our College of Business can help a lot of our technology commercialization.

>> **Chad Mullen:** And, Dr. Sanders, this is, on this, probably important to your, not to many doctors out there also have an MBA. Is that a fair statement, as you do?

>> **Jason Sanders:** It's the minority. It's growing. I think physicians, broadly, as we find ourselves practicing in a more complex environment, and building on tremendous progress over the past decades in terms of the quality of life for patients. We've done so well, were somewhat a victim of our own success because, to push advances forward, it's harder and costlier and the patients we see, especially in the inpatient side, have more complicated illnesses and we're really even going beyond where we traditionally looked for the individual patient, the whole population. So, it's a complex system and I think expertise, such as an NBA, such as Public Health, Public Policy, Fellowships, and then Dr. James Tomasek will probably touch on the way on research side that adding [inaudible] trainings on the research side to traditional clinical training will help us train more effective professionals.

>> **Chad Mullen:** Well great. We have about a minute left in this segment. Just quickly, give you a chance then, Dr. Tomasek to brag about OU Health Science Center. What makes it different than some of the other Centers in the U.S?

>> **James Tomasek:** So, what really makes this unique is we are one of four academic health, complete academic health centers in the country which means we've got all six professional colleges on here. Most people think of us just as a College of Medicine but, in addition, we've got the College of Pharmacy, we've got the College of Dentistry, we've got the College of Allied Health, we've got the College of Public Health. So, what's really great is that we can have all of these various people brought together in our one College here and our one Institution plus, we've got the Graduate College. So, we've got graduate students and post docs as well. So, it gives us a real opportunity to have true interdisciplinary team based research and hopefully we can talk about some of the teams that we've built now that cross the different colleges and how these can really help address some of the health issues that we've got.

>> **Chad Mullen:** Well great. That's fantastic. I think one of the other things that makes us unique is in addition to having all of the University's and all of the Colleges that you talked about, we also have a World Class Medical Research Foundation. When Dr. Judith James here is part of that and when we get back from the break, we'll learn more about that. But, Gary sounds like we've got some exciting things to talk about.

>> **Gary Owen:** We do and you know the clock always demands how we take a break. So, we're coming to you from the OU Health Science Center, and I'm telling you this is going to be a great program to listen to as you find out all the advancements and some of the studies going on here at this campus. We'll come back with more, on *Oklahoma Innovations*.

[Music]

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>> **Gary Owen:** I'm sure most Oklahoman's, at one time or another have either passed by or have been on the campus of OU's Health Science's facilities at OU's Health Science Center located just in the States Capital area, just down the street and OCAST, as a matter of fact, their offices are in part of that campus as well. We're visiting with Dr. James Tomasek and Dr. Judith James, coming up on our next segment.

>> **Chad Mullen:** Yeah, Gary had some exciting information that we heard on the first segment and we were talking at the break with Dr. Tomasek, he mentioned that OU really has some pretty impressive research strength. Dr. Tomasek tell us a little bit about those.

>> **James Tomasek:** Sure, so it's really an exciting time now for research in biomedical sciences. So, in terms of the basic science research, we can now sequence the genome in a couple of days. We can do proteomics, that is look at large scaled protein expression in various cells and tissues. We can do metabolomics, so we can look at metabolites and their products and such. So, we do all kinds of really great, new, types of things we couldn't do before in terms of the basic science. And, what's really exciting now is we're taking these findings of the basic science and translating these to really start addressing some of the key major diseases and such that are facing us, and we're really -- we've got some real areas on campus that we're really trying to build our strengths on. So, one is the area of cancer and trying to look and see how we can understand cancer and translate that and help the patient. So, we've got the Stephenson Cancer Center which is really growing significantly and our goal is to become an NCI designated cancer center. And, we're going to be putting in our large P30 grant to NIH in October 2017 for that. So, we're building for that. We also have diabetes research which is one of our strengths and key areas that we're looking at with the Herald Hamm Diabetes Center. We've got some really great and interesting work being done in terms of diabetes and the effect it has on patients and such, as well as translation that Dr. James will talk a little bit about, about some of the ways we're translating the things from the Harold Hamm Diabetes Center. And then, we also have vision neuro science. So, we've got some really interesting basic science looking at vision problems associated with the retina and cornea, and interfaces with the Dean McGee Eye Institute which is on our campus. It's not part of the Health Sciences Center itself, but it's doing great clinical studies and they're partnering together there. And, we've got the Aging Renal Center which is growing and as we'll talk about, just got to Nathan Shock Center for Aging. And, what's really interesting with aging is everybody before, you just looked to see how aging processes occur and the new buzz word for aging now is geroscience.

>> **Gary Owen:** Yes.

>> **James Tomasek:** And, what geroscience is, it's not just looking at the aging process but looking at how aging affects all of the other diseases and processes going on and if you look at it, probably the number one risk factor for heart disease, for cancer, for diabetes, a number of things, is aging.

>> **Chad Mullen:** Are you paying attention Gary [laughing]?

>> **James Tomasek:** So, if we can understand the aging process we can maybe understand a lot of these diseases and that's really part of the idea with geroscience.

>> **Gary Owen:** I have a curious question you know with the baby boomers. We talked about the baby boomers and we got a growing concern, nationwide, because of the growth of the baby boomers coming of retirement. You're seeing a growth in assisted living centers, retirement centers, and I wondered if that was a trend going on with geosciences as well, to put more focus and investment in that type of research?

>> **James Tomasek:** Well, geoscience is really much more on a basic science side. But, we also have a very strong gerontology department that just got a large grant from the Reynolds Center which is really just doing that kind of thing which is looking at how to help people and assist them as they get older. And, in fact, I mean part of the thing now is not just thinking about aging, but how do you stay healthy as you age. That's really, rather than lifespan, we want health span. And, that's really what we're looking at.

>> **Gary Owen:** Okay, we've got time. Let's introduce Dr. Judith James. She's Associate Vice Provost for Clinical and Translational Science. Give us-- what does that mean?

>> **Judith James:** Please, let me explain that for you.

>> **Chad Mullen:** Yeah, that's a big word.

>> **Judith James:** I am actually dually trained as a physician, so I have my MD, and then a PhD in microbiology, and immunology and so my entire career I've been very focused on understanding how my patients are feeling and trying to dissect the diseases going on in those patients. And so what the Clinical and Translational Science Institute does here at the Health Sciences Center is to try and bring together basic scientists from many of those areas you've just heard about with Dr. Tomasek and partner those with clinicians. They may be physical therapist, they may be nurses, they may be physicians and to put them together on interdisciplinary teams to dually address the health issues in Oklahoma. So, I'm a fifth generation Oklahoman from a very small town in North Central Oklahoma and I've seen that we have many diseases that are very devastating in our State. Unfortunately, we rank number 49 in cardio vascular outcomes and we rank very poorly in diabetes but, that number is getting better and we think by basically understanding some of these underlying concepts and then applying those to actually how we care for the patients, and then doing research on how to best disseminate this information, throughout all of the practices that we have throughout Oklahoma and of course, in other places as well, that we can improve the health of Oklahomans.

>> **Gary Owen:** Now we have, we have -- I'm sure you have a lot of collaborations in surrounding states because Oklahoma isn't the only state in the central U.S. that has these kinds of lifestyle medical problems.

>> **Judith James:** Right, we have very strong collaborations with our colleagues in Kansas and so we have strong partnerships with our Tribal Nations which of course, are based here but, also have members of their population that are spread throughout the United States. That led to a strong collaboration with Alaska and Alaskan natives so, we have collaboration with the Anchorage, with the Alaskan Native Medical Center. We also have collaborations with Arkansas because they're addressing many of the same issues as we are as well as Louisiana, Nebraska, and many other states that you would think of kind of like us.

>> Gary Owen: And is there any other campus to the magnitude of what we have here in Oklahoma City, as far as when you look at the entire campus, is there anything in -- outside of possibly Texas, I guess and Dallas or Houston, do we have any other kind of campuses, educational campuses like this in the immediate area?

>> Judith James: And so I think that we have some very unique strengths and so as Dr. Thomas had pointed out, we have all of these different colleges that are all located here on one campus but we also have close collaborations with OU Norman, with OU Tulsa, that I'll talk about a little bit in the next break, as well as collaborations with other institutes. And so, I think that makes us very unique. We also have the partnership that Chad pointed out with the Oklahoma Medical Research Foundation which is where my dual appointment is, and so I think that that novel partnership in Dean McGee Eye Institute that those kinds of unique partnerships really position us in a perfect place to do clinical and translational science.

>> Chad Mullen: Dr. Judith James and Dr. James Tomasek, our guest with the OU Health Sciences Center. When we return on *Oklahoma Innovations*.

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>> **Gary Owen:** Welcome back to *Oklahoma Innovations*, Chad Mullen's and I are coming to you from the campus of the OU Health Sciences Center. Our guests, so right now we're talking with Dr. James Tomasek, who, by the way, in his research he's kind of got a specialty. He's a distinguished research -- got a distinguished research career in the area of biomechanics and molecular and cellular bases of wound healing and tissue repair. I know some people that have had some problems with those kinds of health issues. And then, we also have Dr. Judith James with OMRF. You've got quite a background too. Several years in the lab and -- I don't have a lot of time here to go in to it, but you've covered a lot of territory. Give us real quick about your lengthy background as well because you've got some good stuff here.

>> **Judith James:** And so, we work in auto immune diseases and so that's how your normal defense mechanisms, called your immune system and it can start attacking yourself. And so, auto immune diseases that are listeners probably know about are type one diabetes, rheumatoid arthritis, and our program really focus on those, plus things like Systemic Lipomatosis and Sjogren's syndrome. If you put all those diseases together the affect about one in seven people in this state. And so, our research really focuses on how those diseases start, how we can identify people at high risk, and we're going to do two of the very first prevention trials. One for rheumatoid arthritis and one for Lupus.

>> **Gary Owen:** Really?

>> **Judith James:** We're going to start here in Oklahoma and we're very excited about that. And then, we also have other parts that work on the genetics and how these diseases develop and the immune system goes awry so that we can develop better therapeutics. Because, we also go all the way to clinical trials and outcomes based research, and using health information to basically help us dissect these diseases.

>> **Gary Owen:** Wow that's impressive.

>> **Chad Mullen:** Absolutely, and Gary I think kind of the unique campus that we've talked about here, the unique collaboration led to pretty impressive grant and new center being developed here. So, the OU, the OU Health Science Center, OMRF, and the Veterans Administration received a joint grant from the National Institutes of Health to create the Nation's first ever Nathan Shock Center of Excellence in basic biology of aging. And so Dr. James and Dr. Tomasek tell us a little bit about that grant and what it's going to do for Oklahoma.

>> **James Tomasek:** Sure, so the Nathan Shock Center grants are grants that are given to Institutions that have strong aging programs. So, we're fortunate, we've got one of these grants and as you mentioned, it's a collaboration between OUHSC, the VA, the Veterans Administration Hospital, and Oklahoma Medical Research Foundation. I think this highlights one of the key areas that we're really trying to work on here that I talked about previously, and that is this team based approach to doing science these days. Really no longer it's just the isolated researcher working in their lab on their single RO1 grant and just focusing on one area. You've got to work as a team really, to work and address some of these complex problems that we have to address to really address diseases and such. And, the Nathan Shock Center is an

example of that type of team based approach. So, the idea with the Shock Center is to build a Geoscience consortium here and at the Health Science Center and across the state. It's going to also involve OU Tulsa as well as the Laureate Brain Institute. We're going to -- with this have -- part of the grant is to fund junior investigators and help them with their research and also set up cores. So, part of the idea is to really set up cores which researchers need to address their problems in aging. And, there's four cores that are going to be set up. There's a multi-plexing protein quantification core, so in real language what that is, is its going to be able to look at complex protein expression in cells and look and see how that changes with aging. We'll have a targeted epigenomics core, and everybody knows about genes and gene expression these days and DNA being the basis for that. It turns out that as you age, or during just normal development, that the DNA is modified and this also controls gene expression and epigenetics is really a critical part and we can now look and see at these modifications on DNA and how this effects gene expression. This probably key in some of the aging processes as well so this is a core that will be able to allow us to do that with aging tissues. We've got an integrative redox biology core which will look at oxygen free radicals that are produced as cells generate energy. Normally cells have ways to get rid of these, if they don't get rid of them properly we can have oxidative stress and get oxidative products and this could look at that and that's one of the things that also seems to happen with aging as well. And, we've got a discovery bioinformatics core, and now as we sequence the genome, get these genomics, proteomics, [inaudible] data, these are very large data sets so the bioinformatics group can take all of this data, help process it and what else is really interesting is let's say you've got a gene of interest, they can go and search all the literature, look to see who's published on that, try and see how it may be expressed in different tissues and then they can look for correlated genes that go up and down with that, all just by searching the literature, all kind of in a library type of research approach rather than a bench approach. So, these four cores are really going to set up the Nathan Shock Center and they're not going to be just used by OUHSC researchers, part of the Shock Center is this going to allow aging researchers across the country to come and use these cores as well.

>> **Judith James:** So, Dr. Tomasek, can I talk a little bit about how the Oklahoma Clinical and Translational Science Institute really was excited to see us put together this Shock application and to help with that? Because, in part, you have very sophisticated, very scientific, very scary sounding, cores in the Shock Center. But, what the Oklahoma Shared Clinical and Translational Resource does is that we help get samples from patients or from individuals who are healthy and are aging in a very healthy way and provide those samples to investigators in the Shock Center so they can dissect all of these important mechanisms. But, I think you bring up a really good point, and one of the things we're really trying to build in Oklahoma are these large teams that can go after and compete very successfully at the National level for multi investigator grants and so, the Oklahoma Shared Clinical and Translational Resource was one of those that when it was funded it was actually the biggest grant ever given to the State of Oklahoma, crossed multiple different institutions and touches almost the entire state. But, we've been very excited to see a grant that kind of grew out of that from a partnership between OUHSC Health Sciences Center and the Family Medicine program with OU Tulsa. And so this is a collaboration between Dan Duffy in Tulsa and Steve Crawford, here in Oklahoma City and they're kind of the leaders but they have a huge team with great infrastructure that are going to try and address this important issue we talked about in the last segment about cardio vascular outcomes in Oklahoma. And so, we know that we're not doing as well as we would like to. We also know that we have wonderful clinicians who are taking care of patients throughout our state but, many of them are having to

take care of an entire town, if not an entire county or maybe even multiple counties. And so, you know, they also know that there's a million papers published a year talking about the new science and the new research, so how can they distill that down and help it to implement it to help all of our patients? And so, that's what this new grant, called the Healthy Hearts for Oklahoma is going to try and do. And so, its research that disseminates information that we know out in to practices and then find how we can help practices do this, and communities do this in a way that will actually improve the health of Oklahoman's. And so, it's implementing the four ABC's of heart health which are Aspirin use in high risk populations, improve your blood pressure control, improve your cholesterol and the S is for Stop smoking which unfortunately Oklahoma, we love to be over achievers and we still over achieve in smoking. And so, but those are the four things that we're trying to implement. And, hopefully, we'll find best practices in the things that work in these communities and in these practices and then we can apply those to other health issues that are important in our state.

>> **Chad Mullen:** And, I'll address this question about -- it sounds like, and we certainly saw this in the transportation sector and the manufacturing sector with the improvements of connectivity and data acquisition, big data first became kind of a novel thing and then it almost became a problem. We had some much different information and Dr. James just said, "a million papers a year" and so if I'm a practicing physician I'm probably not reading a hundred papers a year, much less a million papers a year. Tell us, how has this connectivity with the world, with the globe, across the state, across counties, how's that helped you and then what are some of the challenges that's created? And, it sounds like you're addressing some of those.

>> **Judith James:** And so, as a clinician I can tell you some of the challenges of having the electronic health record, where I feel like I'm talking to the computer more than I'm talking to the patient and I try really hard not to let that happen. Computers are great for helping collate and synthesize information so as part of this Health Hearts for Oklahoma we're actually using a central health information exchange that basically takes information from regions, takes out all of your private information, and just tells us how we are doing with hospitalizations, ER visits, with medication you use, with complications. And so, that's through my health and is led by David Kendrick from OU Tulsa. OU Tulsa has started a new department of clinical informatics.

>> **James Tomasek:** What's real exciting is to address this issue. We actually got a brand new department that started in OU Tulsa which is our community medicine part and this medical -- Department of Medical Informatics is to address just these issues, and it's really put there to study how you use health information to improve patient outcomes, just like Dr. James was talking about. So, the idea is to go and look at the electronic health records, pull information from that, look to see how best to use this information to send it out to your patients and make more efficient and effective patient care. And, it's a really interesting science just in that.

>> **Gary Owen:** I've got to take a break here. Dr. James and Dr. Tomasek, great information here. When we come back you may question, so how do these programs get all of this funding? And also, we want to take a look at it from the student's perspective. What a wonderful education they're getting here at the OU Health Sciences Center. When we return, on *Oklahoma Innovations*.

[Music]

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[Music]

>> **Gary Owen:** We hope you're learning a lot more about what goes on at the OU Health Sciences Center and many of our listeners probably have been on the campus for medical treatments and doctor visits but perhaps didn't realize all of the wonderful research and innovation going on on this campus, Chad.

>> **Chad Mullen:** Yeah, absolutely amazing to hear about really the collaboration between the University side and then the Clinical side, the hospital, the VA, the OMRF. So, it's very interesting that -- for our guests today I want to talk maybe a little bit about the students there because, there are a medical school, nursing school, dental school, an Allied and Health school, I may be missing one, but several students that are in the area that are learning. The next generation of physicians, clinicians, and researchers and, Dr. Sanders tell us a little bit about kind of the unique student experience that happens here at OUHSC.

>> **Jason Sanders:** Well, thank you for giving us the opportunity to share with your listeners. We think it's a significant strength of the Health Science Center. We have seven college's here, over 3,400 students. We have nearly 800 physicians in residency and fellowship training programs. Nearly a hundred post-doctoral researchers and part of our mission is to integrate those professions. The healthcare, delivery environment on the clinical side is increasingly team based. If you've been a patient or have a loved one who's needed clinical care you see the team. As I mentioned earlier, care has become so complex we've made so much progress. To make incrementally more progress we have to push and push and work together and bring the expertise from each area because each discipline's knowledge base just grows exponentially. No one person can summarize all the information in the Harrison's textbook of medicine as was done in the early 20th century. We have several programs to encourage this because we, again, we think as we train Oklahoma's work force both on the clinical side and research, we need them to work together. So, we have interdisciplinary education pilot programs including Just Tomorrow, as we're doing this interview, it will be different for our listeners but we have 800 of our students, so nearly a quarter of all the students here, the first time this has ever been done. We'll sit together in a classroom and learn from these profession. And, I'll just end on the research side that what we teach our students, what our faculty model is asking questions, pushing knowledge, and it's hard to do because it let alone just to master the knowledge that we know. But, we do try, even at the earliest stages to encourage our students to ask questions that challenge the assumed wisdom, to use experimentation, to use research, to drive our understanding forward, to

drive medicine forward. And, research is to all of our missions, having students work together from different disciplines is part of our strength.

>> **Gary Owen:** You know what I love about this generation, from all areas, I don't care what they're studying, is the enthusiasm and the creativity and talent out there. And, in medicine, how does that reflect back to the environment here? Because, I mean I'm sure you get some surprises from a research standpoint in the labs to the people who are involved in becoming a doctor or a specialist, or a nurse or what have you. I mean talk about the energy or the synergy if you will, of the student from the student's perspective.

>> **Judith James:** And so I have been very fortunate to have over 80 students come through my lab now. And so, and they've been everything from high school students to college students, to trainee's who are doing their fellowship and they just bring in excitement and enthusiasm and this quest for knowledge that just changes the culture of what's happening in your research group and it's exciting for me as a native Oklahoman to see these kids come from Guymon and Duncan and Bartlesville, and Tulsa and Edmond and come to the lab and get excited about science and find ways to think about, even if they end up in medical school or nursing school or PA school that they have this research infrastructure from having worked in the lab.

>> **Gary Owen:** Well here's the other thing too as in a patient, as we get older, those of us in this room, this is the generation that's going to be up on the newest, latest therapies. The newest, latest treatments and sciences because that's -- and who knows where we're going to be a decade from now.

>> **Jason Sanders:** I mean it's so critical to train these individuals both as the next generation of researchers and the next generation of health care workers. And, they've got, like we were saying all this huge amount of literature and data and such trying to understand all of that and I mean they've got to find some ways to be able to synergize this together and understand the issues and problems. So, it's really exciting to have these students around and as Judith said, having them in your lab is really a great opportunity. So, I haven't had as many students come through my lab as she has, I've probably had about 40 graduate students or post docs come through my lab. But, it's really exciting to have them. And, one of the things I don't think people appreciate as much is how much of a research engine at the Health Sciences that our graduate students and post docs really are. That they really do a lot of the bench research. And, they are the ones who are really challenging your thoughts, coming up with new ideas, and really pushing things forward. So, it's really a great opportunity to have those on our campus and being trained as well.

>> **Gary Owen:** And that was the core of my question. I'm glad you brought that up. We'll talk about all this research Chad, of course with OCAST, his staff deals with this all of the time and that is funding. We talked earlier in the program about the National Funding from NIH which you mentioned during the break is becoming more challenging. Would you talk to our listeners about NIH?

>> **Jason Sanders:** Sure, so the Gold Standard for biomedical research funding is getting funding from the National Institutes of Health. Most grants that you get, are typical, are one grant is for five years. It's about 250,000 per year. So, it supports your lab, students, technicians, and such in your labs. The thing is that now the funding rate in 2000 was at about 30 percent. It's now down to around 15 percent so it's much more competitive to get grants these days. And, in fact, the average age for new investigator getting their first R01 is at about 40 years of age.

>> **Gary Owen:** Wow.

>> **Chad Mullen:** So, yeah. So, what that means though is that it's really critical that there's other sources of funding, at four junior investigators to get there research going, get results that they can put out there, to get their NIH funds, or for senior people if they've got a grant that's going to go in, it may not get funded the first time. You've got to resubmit. You need funds to keep the lab going. In fact one of the worst things to do is to lose your funding. If you lose people in your lab, then you've got to retrain people and it's a huge problem and an actually very ineffective and cost inefficient when you do that kind of thing.

>> **Gary Owen:** And when you talk about the challenges of National Funding that puts a lot more emphasis on the local [inaudible] side.

>> **Jason Sanders:** Yes, very much so. And, in fact, Judith and I were just talking that both of us got our start with OCAST grants. And, in fact, OCAST grants are critical, especially for our junior investigators to get them so they can get the results that they need to go and turn these in to an RO1 grant. So, I said both of us had that. In fact, I've been funded continuously since 2000 except for one -- about two years ago I had a grant that didn't' get scored. Luckily I got an OCAST grant which kept my lab going until I got my grant funded again. So, OCAST is great that way and is really critical. Plus, senior scientists who may have a new idea, the need results to get their RO1. OCAST provides them funds for that as well. So, it's really a great opportunity to have that in this state for our researchers.

>> **Chad Mullen:** Well, and Gary, as you're well aware, our health research grant has been in existence since 1987 and was kind of the impedance for the agency originally. So, OCAST is -- I mean we play a minor, minor role in some of the great minds that -- for instance are sitting around this table. The amount that we provide is a small amount. It's a seed amount and it is to do just that, to move on to the next level to maybe maintain some lab staff and space, and to make sure that the Gold Standard, as Dr. Tomasek said, within NIH funding is achieved and to that point we've been able to leverage well over three billion dollars in NIH funding in this state since the inception of our agency through just those small grants. So, for all those listening in Oklahoma, thank you for continuing to support that in our state. And, I want to -- before we kind of wrap it up, my wife, for many years, was a nurse in PICU which is the pediatric intensive care unit, at Children's Health Center and you know, I kind of, knock on wood, have been very fortunate. I have not had to spend any time in a hospital other than from my birth and.

>> **Gary Owen:** Your day is coming.

>> **Chad Mullen:** It may be, it may be. But, it was -- you know, I kind of had maybe the television impression that a doctor would make a round in the morning, you know, nurse maybe would bring some jello or something, you know and when she came to work that I really had a great understanding of just how fantastic the whole collaboration was. The doctors and the nursing staff worked very well together and then the researchers coming in and being involved throughout the entire process was simply amazing.

>> **Gary Owen:** We only have a minute left and I wanted to give Dr. Sanders a chance to say -- we always say, where would you like to see the campus ten years from now? I mean you've obviously come a long way. Brief comment.

>> **Jason Sanders:** Ten years from now we will have treatments that we couldn't imagine today. Ten years from now we'll see the fruits of investments that are being made today that we didn't

know the outcomes from. Ten years from now our care will be more integrated, it will be more seamless. When you come here your care will be even more coordinated than it is today. We'll have advances not only for you as an individual, but for people in your community as we look at public health. We will have more clinical trials available for you, not only in oncology but, across other areas. We will be able to see in ten years, all the fruits that were born by a dollar invested today.

>> **Gary Owen:** That's awesome. We encourage you to get on the OU Health Sciences website, do research among the campus and the different medical facilities here. Kind of uncover yourself what they're doing here. Chad, it's been a great show.

>> **Chad Mullen:** Absolutely amazing.

>> **Gary Owen:** And we thank you for having us here at the OU Health Sciences Center and we hope you'll join us next week for another edition of *Oklahoma Innovations*. Have a great week.

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