John Boccacino:

Hello and welcome back to the 'Cuse Conversations Podcast. I'm John Boccacino, senior internal communications specialist at Syracuse University.

Lisa Manning:

It's at the intersection of materials and living systems, which sounds a little weird, right? Because you think about materials as something that's on a car, and then you have a living system, which is an organism like us. And the idea is that there's types of materials called biomaterials that interact with living systems. There's types of materials that are bio-inspired, which means that they have features or functions or can execute tasks like intelligent new types of materials that act like living systems. And finally, there's this idea that, well, organisms are actually secretly a material. Our bodies are a physical material that does things and has specific properties, and by thinking about living systems as materials or having mechanical interactions, we can come up with new hypothesis that might even someday drive treatments for a disease.

Jay Henderson:

We're trying to figure out ways to solve really big problems, right? We're trying to figure out how we can combat things like antimicrobial resistance to antibiotics. That's a big problem that could affect many of our lives. How can we better treat injuries when they occur? Whether it's a traumatic injury where you're trying to stop bleeding, or maybe it's an injury or disease that's developed over time and there currently are just not good treatments available. How can we use materials to try to do those things? So some of the biggest challenges facing our society might have solutions rooted in the materials we could use to address them, whether it's treating an injury or a disease or capturing energy in some way that it can't currently be captured to address things like global warming or combating COVID. These problems that are going to continue to face us into the future.

John Boccacino:

Our guest today on the 'Cuse Conversations Podcast, we are going to dive into the heart of research here at Syracuse University. It's BioInspired Syracuse. It really is a phenomenal resource here on campus. The tagline is addressing global challenges through innovative research, and the two faculty members we're going to welcome on today have a lot to do with both the past success of BioInspired and where this is going as a framework for our talented faculty and student researchers here at Syracuse University.

John Boccacino:

Our first guest is Jay Henderson, a professor of biomedical and chemical engineering in The College of Engineering and Computer Sciences. He recently was appointed the director of BioInspired Institute. Jay, thanks for taking the time to join us.

Jay Henderson:

Thanks, John. It's a pleasure to be here. Thanks for having us.

John Boccacino:

And our second faculty member, she served as the inaugural director of BioInspired Institute. She's Lisa Manning, the William R. Kenan Jr. Professor of Physics in the College of Arts and Sciences, and Lisa was

instrumental again in really laying the groundwork for

is what I did in science fair and first got hooked on, and then realizing I worked on a biochemical fuel cell when I was like 15. And so I was trying to build something to make electricity and it was really fun, and I felt like

Jay Henderson:

And SU has a lot of resources to make that possible. We're lucky as an institution to be able to team with units on campus like the Sources office, whose mission is to provide ways to support undergraduate researchers as they get started on their own research careers. So I think that's exciting part about research in undergrads. It's getting them outside the classroom and giving them opportunities to really learn about what they might want to do or maybe what they don't want to do. It's about trying things out and figuring out what direction you might want to go in the future.

Lisa Manning:

Yes, and I think too, the great thing about the generation of students that's coming in is they're really galvanized by these big problems. They know we have to address climate change. They want to help find treatments for congenital disease. These things are on their mind and it is really important to them to make an impact. So I think the fact that BioInspired can address these really forward-thinking big

they'll have more and more opportunities, whether it's at SU or maybe they're going somewhere else during the summer, to continue to get these formative experiences, to continue to strengthen their toolkit and build their resume so that once they finish their undergraduate years, they're able to go out and compete for whatever it is they want to do. Whether it's a job or they want to go to grad school or med school or some other opportunity.

John Boccacino:

How pivotal is our relationship with the NSF, the National Science Foundation, in setting up our student researchers for success and then also allowing the grant money, the seed funding to come in so that our students can pursue their research passions without worrying about how am I going to pay for this?

Jay Henderson:

Yeah, it's a really good question. And unfortunately, like so many things, money is often a prerequisite to achieving some of the goals you might be setting out to do. And research is expensive. So being able to compete for the funds that are necessary to keep the lights on and do the research is a big part of having a successful research program like SU. So luckily, the institute, as Lisa pointed out, we're able to bring together some really strong building blocks on campus informing BioInspired, and she and other leadership were able to identify areas where we could invest further to make sure that we had the kind of teams that could go out and compete for funding. And BioInspired members have a really strong research funding portfolio, and not just from the National Science Foundation, but also from other federal agencies like the National Institutes of Health, which funds broadly medical and healthcare related research and other agencies like the Department of Defense, which doesn't just do research related to war fighters and things like that.

Jay Henderson:

But also many different technologies that have great spillover into societal benefits outside of the military sector. So I think one of BioInspired's big successes has been recruiting and retaining and cultivating faculty who can compete for the research dollars that are required. And we've had a really successful seed funding program that Lisa started during her directorship, that has allowed us to use some of our own institute funds to get these seed projects going, as you're referring to. And a seed project that's successful and may involve some undergrads and a small

And so what we're trying to do with seed funding is basically get some preliminary data to demonstrate that an idea is feasible, so that when other scientists and engineers peer review it, they can say with a little more certainty, does this seem like it's going to work?

Lisa Manning:

When you have a great team and you have great preliminary data, you're in a really good position to make a case to your fellow folks who understand the details that this is something worth putting our resources towards. And so within the institute, we thought, "Oh, it's important for us to peer review within the institute our peers." So we have a very kind of formal rubric that ensures fairness, and we have criteria including contributing to diversity and inclusion on our campus, because we know that the most successful teams are diverse teams. And we also know that part of what we're doing here is training students in these research projects too. So all of that goes into our internal review process,

I would just point to other universities on the Hill who are invaluable partners for the institute and for the university. So our members, many of them, the majority come from Syracuse University, but we also have members from SUNY Upstate, the med school across the street, and SUNY ESF, the SUNY College of Environmental Science and Forestry, which has a campus contiguous with ours. And this broadens the intellectual environment in which we and our members work. So we have some great academic partners in addition to the kinds of industrial and corporate partners that Lisa mentioned.

John Boccacino:

Being the person who helped get BioInspired off the ground, take us through your thought process and how did it come to fruition because now, three plus years later, Jay's taken over a well-oiled machine that has us positioned as a worldwide leader in research. How do we get to this point with BioInspired?

Lisa Manning:

Yeah. Well, thank you for framing it that way. I would say that basically, it's the other people in the institute. And I also actually think our university deserves a ton of credit because this is one of those things where we had a fluctuation that led to this amazing group of scientists and engineers who were excited to work together and we really needed...

Lisa Manning:

So once you have a group of people like that, you need staff support, you need space, you need resources in order to get all of this stuff off the ground. And especially if you want to bring workforce development piece like where we're training graduate students in soft skills, and we're creating a cohort of postdoctoral associates who can work together. Science is a social endeavor. And so when you like the other people on your team and you see them socially, you might go out for dinner or drinks or something, that makes it actually more fun, but it also makes it more effective because you start talking about some offhand crazy idea you have and then you scribble something on a napkin and then three days later, there's a working prototype in somebody's lab because you got excited about the idea.

Lisa Manning:

So I think maybe what I would say is there was a lot of support from the university to get us to the point where we could make sure that those types of interactions were happening regularly. And I saw my job as director as basically trying to allocate the resources that we had in order to facilitate those type of interactions, that resource development, that seed funding. And also, I think one of the things that is really great about the culture of our institute is we have a ton of leadership positions to bring people up through the pipeline to become the new leaders in the future. And so we have different focus groups. We have 13 sub leadership positions, and that's intentional because there's lots of great people with great ideas who can bring forward things. And we thought very intentionally about the structure and the processes that would give everyone a voice, and that would really allow us to collaboratively filter the best ideas and focus on collaborative ideas that would allow us to be excellent.

Lisa Manning:

And I have to say, now I go to conferences and people know that we're from the BioInspired Institute, and they talk about the new hires we've made. And in science community, it's almost like being a rock 5 beinzy

known for is this BioInspired stuff. So in addition to the medical devices, there's all this challenges in sustainability and food safety and monitoring the ocean environment and these smart materials that are inspired by biology are really something that is cutting edge and new, and we're right at the front of it because of the choices we've made. So that's why it's exciting.

John Boccacino:

I know you, Lisa and Jay can't walk into varsity without getting mobbed by adoring fans who want to buy you slices of pizza, right?

Jay Henderson:

It's a real problem.

Lisa Manning:

Yeah.

John Boccacino:

And Lisa, you set that up perfectly for my question for Jay here, because I also love organizations that promote from within. And Jay was the associate director before taking over July 1st as the new director. Jay, take us into your mindset. Why did you want to get involved with BioInspired in the first place?

Jay Henderson:

I've been at SU since '2008, and when I was recruited here, it was in the biomaterial-sey area. And so, one of the areas that Lisa referred to that merged together a few years ago to provide what is now BioInspired, the starting material. And the university obviously has invested substantially, additionally to round that out and to really make it cohesive and strong.

Jay Henderson:

So my interest in these related areas goes back to when I started at Syracuse University, and having had the opportunity to work as the associate director with Lisa, I was really excited that she had the vision to build BioInspired into what it is now. And she did a lot of that critical formative work that needed to be done to bring together the members who were already faculty here, but also to get the university to invest in the cluster hiring that took place, that really helped round out that team so that we could strategically fill gaps or we could compliment existing areas. And I was really excited to see that happen. And the reason I'm excited to continue to be involved is now that all of that critical work has been done, I think we have this amazing foundation to do even more. The sky's the limit here.

Jay Henderson:

And Lisa's referred to areas in which we've already been doing a lot, both basic fundamental science, meaning understanding how the world works without necessarily having immediate applications and applied science where we do have critical needs we're trying to address right away. And Lisa also mentioned workforce development and trying to make sure that we are contributing to the university's mission to educate and to put people out into the workforce who can help have meaningful impact, whatever the economy looks like. So there's a lot that we've been doing, but I think there are a lot of exciting directions we'll be able to go using that as a amazing foundation.

John Boccacino:
You mentioned Jay, the cluster hires

John Boccacino:

Syracuse University prides itself on being a welcoming institution where all students can come in and pursue the challenges that they want to pursue with their academics. One area in particular has been STEM, trying to get more women and more underrepresented populations into the STEM fields. What programming is in place to help broaden that pipeline and what is Syracuse University and Bio-Inspired doing to

Yeah. I'm glad you brought it up because I think it is a fantastic opportunity for those who may be a little outside the institute or way outside the institute to come and learn more about us. So those who come will have an opportunity to see our faculty members and their trainees, postdoc fellows, grad students and undergrads presenting the cutting edge, bleeding edge research that they're working on. So this will be what they're doing now. And in addition, I think those who come will see ways in which the institute is having impact outside the lab. So one thing that we're focusing on this year is trying to make sure it's apparent to those who attend is all the different types of outreach activities and other activities that our members participate in.

Jay Henderson:

Because in addition to being very diligently active in the lab, many of them are getting out into the community. They're getting out across the country and the world leading projects and programs that may be helping bring science to the public that may be introducing the public to opportunities to get involved in research. And it ties back to my interest and passion in making sure that folks know the opportunities that are out there. I hope that people will come away with a better understanding of how science is having a positive impact day-to-day coming out of the labs of the BioInspired Institute.

Jay Henderson:

And we're going to make sure to emphasize this year some of the other transdisciplinary things that we've been doing, and these are things that have been going on a while. They're not necessarily new. We're just trying to make sure that we are showing them off sufficiently that people know about the all excited work. So for example, Heidi Henley, who's the new associate director of the institute, has for some time been working with artists and others from the social science and humanities at Syracuse to look at what can happen at the interface of science and art. So she's run a bioart group and mixer that brings together people from the sciences and from art to explore that really interesting interface, which can do amazing things toward helping the public understand science, but also creating new types of art. And it's an interesting area that we're going to have on display there this year.

John Boccacino:

Just how surreal is it for you when you walk into the symposium and you see all these poster presenters, all these researchers, the campus community coming together. I mean, this has got to do such wonders for you, seeing the picture come all the way to fruition.

Lisa Manning:

It's amazing. Seeing these things that we collaboratively as a team knew were possible five years ago when we started conceiving this idea, if you would've told me we would be here now, you're right. I would not have believed you. It required some serendipity and a lot of buy-in, faculty and staff and student buy-in to believing in that what we were doing was worth the time. And it's really exciting to see all the impact that that belief and hard work can have.

John Boccacino:

For more information, go to bioinspired.sy.edu. A huge bit of gratitude from myself to our guests today, Jay Henderson and Lisa Manning. I want to thank you both for coming on, for enlightening our audience. Please keep up the great work and thank you for all you do for research and for Syracuse University.

Lisa Manning:

Thank you.

Jay Henderson:
Thanks, John.

John Boccacino:
Thanks for checking out the latest installment of the – µ • Conversations Podcast. My name is John Boccacino, signing off for the Cu •e Conversations Podcast.