

STEAM Talk Episode 7: Image of Research Contest, Maggie DeMaegd

Interview with Maggie DeMaegd, photograph entitled, "Carcinization"

Honorable Mention in the Graduate Student category

*subject to re-naming

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Courtney: Hello, this is Courtney.

Kara: And this is Kara and you're listening to STEAM Talk.

Courtney: This episode continues our series on the image of research contest at Illinois State University. Each year all student researchers are encouraged to submit a photo that represents their work. Today's guest is one *shell* of a researcher

Kara: [laughs] Today, we are premiering our interview with Maggie Demaegd, and our discussion about her research in Carcinization at Illinois State. She submitted a photo entitled "Carcinization" which received an honorable mention from the image of research contest. Let's jump right in.

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Introductions to Maggie DeMaegd, Honorable Mention in the Image of Research Contest

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Kara: Welcome, Maggie, to the STEAM Talk podcast, we're excited to have you today! You are a Ph.D. candidate in the Biological Sciences program, and we're talking to you today about your entry into the Image of Research Contest here at Illinois State University, where you highlight Carcinization, with all of these crabs, and crayfish, in the line, and then, finally, you pretending to be crab, or crayfish, which one is it?

Maggie: I like to think crab, is technically crabs, So I like to think crabs.

Courtney: Channeling your inner crab for the photo, yest\.

Kara: Yes, we've been having fun with Maggie setting up this interview because we kept sending out crab memes.

Courtney: I think we should put them in the show notes.

Kara: We'll definitely add some crab memes in the show notes along the way.

Courtney: I just think the way people write about what you study, is so, it makes it seem so, just, daunting and serious, and scary, like, *everything is becoming a crab*. And then, this is, almost, a public service announcement for people who get scared by articles titled things like that, because now we get to hear about the real side of it.

Kara: Tell us just a little bit about yourself and your research here at Illinois State.

Maggie: I'm a fifth year PhD student, I just defended a week ago now so I passed, I'm officially a PhD! It's gonna be great.

Courtney: Congratulations

Kara: Yeah!

Maggie: I'm in Dr. Wolfgang Stein's lab, *the Crab Lab*. I got my bachelor's at Illinois Wesleyan, which is just down the street, and then I was doing an undergraduate research thesis, I was trying to get into electrophysiology, so like, *actually* recording from neurons. One of Wolfgang's PhD students started helping me get into it, like, actually

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do the research, and then, just kept in touch and was like, okay yeah! I really liked doing this! This is what I want to keep doing. So, I switched over, moved down the street. And now, now I'm looking at crabs.

And I should say that that while I look at crabs, I have to admit, I like crabs, but, they're not the like sole thing that's interesting to me. But, like, really it's interesting to me, it's like, I'm far more interested in how animals are responding to their environment, and how their nervous system is responding to their environment, and how that allows animals to survive. Because, I mean, we're everything in our nervous system, every choice that you make, every behavior that you do is all nervous system. When something goes wrong in the nervous system, or there's an environmental change that happens and this affects the nervous system, then, suddenly you need to think about all of the behavior that's going to be affected. So, if we can understand what's going on in the nervous system, when these things are changing, then we can maybe get an idea about how animals are going to respond to environmental changes, or any kind of you know changes like that.

Courtney: Reminds me of what you said on your website, you say, "I think crabs have too many legs, studying their nervous system is a worthwhile endeavor." I think that dives into that statement, which I was *definitely* going to ask you about.

Maggie: They have too many legs. [laughs] There's, why do you need 10? You don't need 10. That's too many. And they lose them all the time, like, *they* don't even ten.

Courtney: So, it's almost like a nuisance to them. Like, "meh. I can go without this tenth leg."

Maggie: And they do just fine, they walk around they're okay. I think humans got it right when we move down to just two legs to move around. That was enough. We figured it out.

Courtney: Top efficiency.

Maggie's Research

Kara: Your model system is a crab when you're looking at these neurological changes. And so, just this last year you had a paper published in Plos Computation Biology. I'm going to read the title, "**Temperature Robust Activity Patterns Arise from Coordinated Axonal Sodium Channel Properties,**" So you're studying this model system, but you're looking at the neurons, and how the neurons change because of the temperature changes. Can you talk a little bit about your research on campus, and what you do to study how temperature or other environmental factors, impact neural signaling.

Maggie: I should explain a little bit why we use crabs, they're really interesting in that their nervous system is a lot like human nervous systems. Basically, all of the nervous systems neurons, kind of function, a lot of the same ways in almost every neuron, or every animal that has neurons. And so we can get a good idea about the underlying properties, the most basic level, from a crab, and understand that about a lot of other organisms.

But crabs are additionally really nice because they have a really small nervous system. So, the system that I work with is called the semantic gastric nervous system. It basically controls chewing. In the crab stomach, because they don't have teeth, except for in their stomach so the teeth are in the stomach, it's really cool. And they only have about 30 neurons that essentially control all of the chewing and we can find those neurons from animals to animal to animal, so you can kind of think about this like, every human has a cortex and hippocampus, these kind of large brain areas. And you can imagine that, there's a lot of different cells that are maybe not the same, even though you have a hippocampus. Crabs, on the other hand have 30 neurons and those 30 neurons are the same 30 neurons from animal to animal, and they're really easy to identify.

You stick an electrode in them, and you can find them again and again. We can kind of use that to look at what are the, like, individual properties in the paper that you just talked about the, I was looking at sodium channels, which are an important ion channel for generating action potentials. You can look at those individual properties to figure

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out how generally neurons in other species are also going to function in response to changes. And so, with that paper specifically what we were really interested in is that crabs are just really robust little guys. You can kind of think about this like if you have a, you want to do some kind of behavior with your arms or move your legs around you want to walk right. You have a some idea that you've created in your brain, and it needs to somehow get out to the muscles, and so the distance between your brain and out to your muscles is really quite far and the changes that are going to be happening in terms of, especially temperature right is going to be quite different between the center of your head and out by the tips of your fingers and so we were really trying to figure out how do action potentials are signals from the brain actually make it out to the muscles. And how do they do this, even if the brain is one temperature and the muscles are different temperature and so what are the properties that the neurons have to have in order to, allow the action potentials to actually make it out there and do so in an informative way right if you want to move your arm a little bit you don't want a crazy movement with your arms. Instead, you want the signals to be getting out there in the appropriate. I don't know fashion basically.

Kara: Beyond this exploration of temperature and environmental what other research projects or research questions have you been exploring, as you've been working on your PhD.

Maggie: I've been working on a couple of things, it all kind of relates back to this idea called neuro modulation and essentially that's just looking at how neurons change, and different. I look at like, mostly different chemicals how different what we call neuro modulators, everything has neuro at the beginning, so you know the neuron. And I can go a step further and say we work with neuro peptides specifically which are essentially just very small chemicals that are almost proteins but not quite. And looking at how those can improve neuronal robustness. I think this is really exciting, in terms of, like, not just crops, but then also like other animals as well because these neuro peptides are basically ubiquitous peptide modulation in general has been something that's been in the animal kingdom, basically since neurons existed. And so, if you have peptide modulation, and you see peptide modulation, you can understand how that sustains neuronal activity or sustained activity in general, then you can actually get a really good idea about how this is acting in other animals as well. That's the other side of things is not just you know how to things function, or how to have neurons function and temperature but then also what are the neuro peptides what's the neuro modulators that underlie that

Kara: When you're talking about neuro modulation for our listeners, what does that mean?

Maggie: So, nerve modulation is broadly chemicals or environmental factors, basically things that are going to influence how neurons behave. And that can be something as simple as it makes the neuron, a little bit more excitable, and more likely to pass a signal from one neuron to the next neuron. It can obviously go the other way and make the neuron less likely to, you know, produce a signal or and move it on to the next one. But it can also do like large broad shaping of things where you have whole circuits whole brain areas, changing, and now suddenly instead of a soft touch. It's a very painful touch, where it's a much bigger change that you have happening there. And that's just caused by basically anything, if you've if you've got something that's changing a neurons activity, it's probably a neuro modulator.

Kara: All right. Awesome. You talked a little bit about how you got involved in your current research project that you were at Illinois Wesleyan just down the road from Illinois State, and had some mentorship and then that pulled you into Dr. Wolfgang Stein's Lab is there other other pathways that you've taken in or other directions that you've gone as you've become a researcher at Illinois State.

Maggie: I actually took like a gap year in between graduating from Wesleyan, and then starting at ISU where I worked at the Millennium Pain Center in town. And I was working on a thing called a spinal cord stimulator, which is an implantable device that helps people with what we called neuropathic pain, which is essentially a long lasting like a chronic pain that's caused by a early injury, but the injury has healed. And now, the people still feel pain and it's typically in the legs. It's typically in the like sciatic nerve. And so they all have a lot of leg pain, and it hurts and it's-it's terrible on like the well being It's really sad working with them because you're like, I want this to work so

much, so much for you. In a lot of cases the spinal cord stimulators are really really helpful. And in some cases it's not and that was really frustrating to me, because I was like why isn't this working why why do we see it working some people but not in others?

Is there a way that we can work to prevent this kind of pain from happening even rather than just treating it once it's occurring? And so, this is sort of how I got into more of Wolfgang's lab as well and thinking more about not just treating people. But also, what's the like underlying mechanisms and so, to go back to your actual question of like how did I. How did I get here what's the path, it's more of like I did school and I was like yeah I need a break from school. How can I help people, how can I do neuroscience and things like this and then realized, Oh, it's not just the treatment that I really want, it's the it's the prevention I would love to prevent a lot of these neurological things and so getting that the heart of it is sort of how I fell into Wolfgang's lab and have have been enjoying myself sense of really getting that that like very fine basic research of things.

Courtney: That's an excellent story and it's an excellent motivation and I think that's really insightful to hear that you had a gap year to kind of really figure out the underlying motivation for you in pursuing your next step. I would definitely suggest a gap year to people in the same situation

Kara: And I took multiple gap years of a gap years

Maggie: I would totally recommend it gap years. I mean, because in my mind is like always like refreshes you. you can take a minute to take stock and say, What am I missing like what is it that I think is going to make my life better and then if it's grad school then hey great like you can jump into it and know exactly what you want to do.

Kara: That's great advice for students that are thinking about pursuing higher degrees. If you know it, go for it, but, if you need that time to just figure out the right direction. It's okay to, to kind of step outside of academia for a bit and it's always there waiting for you in the end

Courtney: I had a professor once tell me that even if you know what you're doing, he would still kind of recommend doing a gap year, just to get some work experience in your field to bring to the table when you go to grad school, or maybe just some time to take a break because getting your bachelor's degree is a lot of work and getting your master's degree is a lot of work. Sometimes, you need to give yourself less to do.

Kara: You're wrapping up your PhD, this year. Yay. What are some of the takeaways that you have from your PhD?

Magge: I was thinking about this in terms of like actual science takeaways. And then I was thinking about this in terms of like the skills and the actual things that I can like work on and it can say I do better as a person kind of thing so the science takeaway is that neuro modulators and especially neuro peptides are so, so important. And this is something that I think neuroscientists in general are going to start looking more into, because we have kind of been not so great about looking at peptides because they're really challenging, they have a lot of different effects and it almost depends on which neuron, you're looking at to determine what the effect that your neural peptide is going to have, whereas some of the other like small biogenic amines are a little easier because they have fewer things they're exactly going to do with their little easier to follow. And there's sometimes a little bit more immediate so I think the the science takeaway from this is that I think that neuro peptides are going to be the future. And I think that's somewhere that a lot of people really should be looking at how neuro peptides are affecting neuronal activity and then ultimately affecting behavior.

So that's on the science side. But then I think on the skill side, the number one skill that I have learned is perseverance, no doubt, it's perseverance, it's something's not working. How do I fix this. and how do I do this in a way that is not going to make me sad for the next hour and move on. And like, what's the what's the way that we can get this to work. So, I, I can say that I've done a lot of experiments where they have not worked, and then you just have to go. Yep. Cool. Didn't work, let's go get some lunch, we'll come back to this in the afternoon go to that.

And then there's the other side of it is like writing a grant. And then, not getting funded and being like, Okay, I just worked like three weeks on that. Yeah, perseverance every time is huge.

Kara: Do you have a specific example of one of your experiments that things weren't going right, I gotta have lunch, or a really memorable moment where you're perseverance shown?

Maggie: I need to explain a little bit about our dissections. From the stage where I have my roaming crab in a tank to the part where I have its nervous system, fully isolated and I can actually start working on it takes me anywhere between two to six hours. When I started, it was taking closer to eight hours, and that's pretty typical for anyone. And anytime within those two to eight hours depending on you know how good you are at it. If you cut one nerve that you're not supposed to cut, you're done, you get to restart.

Courtney: Oh wow, so it's two hours if you do it, or two to six to eight hours if you do it right. Yeah, yeah. That doesn't count like the whoopsie attempts.

Maggie: Uh huh. Oh no, yeah you get one shot and then you're done. And then the other fun part about this is like actually to be able to do interest I live recordings where you record from the neurons themselves by sticking an electrode into the neuron. You need to do what's called desheathing. So essentially, there's this big, not big, it's a really fine tissue envelope around the neurons. and you have to cut that. Very, very last thing you do, and essentially you turn your microscope, up to the highest magnification, you turn your lights as bright as you can get them so that you can see the reflection of the very thin, clear issue. And then you take your scissors, and you have to essentially ground yourself entirely like as much as you can get yourself like press down on the table to stop yourself from shaking because now you have your scissors, next to the neurons themselves, and you can't touch the neurons. You can't poke anything, any of the nerve, the axons of the neurons themselves. And now you have to pull and like lift off this very tiny sheath from the neurons and hope that at no point do you touch anything.

And you do that at the very last step, and so it could be that you do four hours of dissection. And then you get to the very end of it, and you Twitch, whatever you shake. Just, just a little bit in the wrong direction. You get to start over. So, perseverance. Because you do it the first couple of times and yeah you twitch in the wrong direction, you don't even realize it. And if you get it on the rig. You turn everything on and it's silent, it's just flatlined. Yep. Okay, here we go..

Courtney: I'm just like, the devastation that would feel, like, I would take lunch every day, multiple times a day.

Maggie: I think the other side to this too is that you have, like, a life right like this is a crabs life. And so that's something that definitely like, weighs on me of like, any animal that I'm, I'm sacrificing I want it to be for a good reason. And if the reason is simply I twitched at the wrong point. Ugh man, I feel so bad. Like that's, that's, not what you want to see that's not what you want to hear and so, Yeah, I mean you do a lot of practice.

Courtney: I somehow avoided dissection my entire life, in any class, in biology, or anything. That's very interesting that you said that.

Maggie: It helps a little bit that crabs are really mean, they're not super friendly animals, so then you you sometimes don't feel as bad. But then you're like, ah, but no like, I, I like them.

Image of Research Photo:

Kara: We're going to shift gears to talk a little bit more about your image of research submission for the Image of Research Contest at Illinois State University. So, why did you decide to submit a photo for the Image of Research (contest)? What inspired you to take the time to do that?

Maggie: one is I love doing art, especially if I can do art with science. That's a blast! I love it. I wish it had been around for longer would have done this every year like, it's great!

Courtney: it's really new! Yeah! it's really, really.

Maggie: I submitted one last year and it didn't get chosen so I was really excited that this one did. But then I think in terms of like the inspiration for the photo in general, was essentially, the memes the crab memes, I've seen a lot of these, like, carcinization crab memes that I was looking around going, *we have so many species of crabs and crustaceans around here!*

We need photos for them, we always want to put photos on posters, that people know what our animals look like, like. How can I do this and make this have a dual function, both for posters that I'm working on, but also have some fun and enjoy the animals that I've got around here? And so, we went through a couple of different iterations before I finally decided on the setup that I had of just the individual animals. I had talked about doing, you've seen the like "Evolution of Man" (The March of Progress illustration from the 1965 book, "Evolution of Man"), where it has like, man and the caveman and so, I had thought about doing something like that, where you have the evolution of crabs, or, the evolution, that it doesn't quite work because these animals aren't super evolved like that and so that didn't quite work and so then, I was like, Okay, we got to think about Carcinization and nature so I said, explain Carcinization, right? It's nature's many attempts to evolve the crab.

I was like, okay I have all of these crabs, How can I portray carcinization to the best of my ability? get this influence the memes, get the influence from all the different shoes we have, and have some fun with it as well and it ended up with, you know, be great, you could be a crab yourself. Yeah, I'm crabby, it'll be fine.

Courtney: Yeah, that's such a great inspiration and, like, train of process because you're right, the evolution of man wouldn't apply to your research as much because they're not changing. But your interpretation which is you turning into the crab form imitating the crab form physically is exactly what you're talking about. And it's really funny like I definitely got the meme vibe from it. That's why I sent you some memes to introduce myself.

Kara: Did you have a crab photoshoot?

Maggie: *laughs* Yes, Yeah *laughs* Yep!

Kara: *laughs*

Maggie: Yep, so, I had to get help, because you can't just take the crabs out at the tanks and hope that they'll sit still long enough to take a photo of them. If you count the if you count the legs on some of them, a few of them are missing a few legs so...*laughs* whoops. *laughs* We cool them off, and then they chill out.

Courtney: Literally.

Maggie: Literally, figuratively, yeah. And then we had about 10-15 minutes before the lights that we had on them warmed them up enough that they started to crawl away. And so it was, *'take as many photos as you can!'* And like posing them, because, when they're cold, they'll curl up. So, you have to stretch out their arms and hope that they'll stay in that position. So it was 15 minutes of like, arrange them as fast as you can, and then just shoot as many photos as you can. We had the camera on a stand, and then all the lights on the stand, we had a like, I want to put like a green screen, but it wasn't green, it was, like a white screen of, like, paper in a box to hold them all up.

Then for me it was, I needed a bigger box, so I went to SLB (Science Lab Building) 330, moved all the things away from the wall, and then started sitting on one of the tables so that I was on the same position as the rest of the crabs. It was a really fun photoshoot, but also kind of crazy, because you had to do everything on like a timescale of like, 'we need to go fast'.

Courtney: The steps being taken, like, the consideration of lighting positioning, handling the subjects, that's all part of the process of a photography student as well. So, you're indulging in the world of art for this project, for sure, which is awesome.

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Maggie: I think our lab, and I think a lot of the biology labs would do, super well to have professional videos to talk about our research and get some professional photos of the animals or the research setups and stuff.

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Kara: So you have four different species you've got two crabs and two crayfish. Was there is particular subject that was a little more finicky for their photo shoot than others?

Maggie: I want to say the green crab gave me the most trouble. This is the, like, I want to say middle one, it's the smaller of the two crabs, *Carcinus maenas* is the species name.

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Courtney: I would have guessed him.

Maggie: Yeah.

Kara: He looks like a troublemaker.

Maggie: They're a shoreline species, meaning, that they're used to really big temperature changes, you put them on ice, and they're fine at room temperature. So they start warming up really quickly. And, yeah, he was a pain, he was the worst.

Courtney: He kind of looks perky and cute though, like I really liked him like he's got spunk to them.

Kara: A little personality coming out.

Courtney: I also like the way you scaled them to size, you can kind of see the size difference between them all. It's very visually nice to see that scale down and then there's you at the end of the, dun dun dun! We're crabs now!

Maggie: *laughs* My family members have gone, "Do you just work with giant crabs? Is that why you're the smallest?" Like! come on!

Courtney: It's art, you *have* to think about it.

Challenges and advice about the Image of Research Contest

Kara: Anything else you want to share about the submission of the image or challenges or considerations when you're submitting your image for the image of research contest?

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Maggie: I was thinking in terms of, if people want to do it in the future to it and thinking about that, like, for me it was a really good experience to think about, how can I take what I do and make it so that it's a fun image, but that it still kind of captures what I do, but then also it gives is easily understood and easily represented in a photo. And so it was a really nice to take a step back and go, "I am not just deep into the neuro, but, how does this matter to just the general public, people who aren't working on crabs, who won't work in a neuroscience? How do I make them really excited about this research? That's what I want to happen. I want people to be really excited about crabs about the nervous system

In my mind, it was a really good experience to just take a step back and say, "we have all these different species, let's highlight them. Let's make sure that people see that there is really cool stuff going on." It was a super awesome afternoon of photo taking, and then a couple of nights of Photoshop. I would recommend doing it anybody who's interested in doing it should definitely go for it. Take on the challenge of making your thesis and your project into a photo, it's a blast.

Courtney: And you can see that you can get inspired from memes. if you don't know where to look, look to what makes you happy and inspires you to laugh. I think everybody gets a little excited when they find a really specific meme that matches what they do for a living, I know I do.

Advice for Fellow Students about getting involved in research on campus?

Kara: Do you have any advice to your fellow students, undergraduates and graduates, about getting involved in research on campus?

Maggie: Yeah, I have three, I thought about. I always was afraid that I was gonna be bothersome to professors by emailing them of like, "I don't know anything about research. I want to do research," it's not bothersome, just do it. They're so excited. As someone who's, like, taken on and mentored undergrads, you just tell me, "I think that I want to do what you do, but I don't know"...yeah! I'm on it! Let's go! You're excited. I'm excited. Let's go!

That's my first advice. If you're scared about it, don't be, because as soon as you say to a professor, "I like what you do," the professor's can be like, "yes, let's go!"

Courtney: Enthusiasm is contagious. For sure.

Maggie: Oh yeah.

The second piece of advice is that I would suggest, treat any time you spend in the lab like a lab course. if you can, set a time that you spend in lab, essentially like a lab course where you say I'm going to spend three hours every week from nine until 12 doing this research in this lab and I'm going to block that off and I'm always going to be in that research lab I'm always going to be there. That is so helpful. So, so helpful.

The third thing that I was going to say was test out a bunch of different labs, especially as undergrads. As an undergraduate, you should tell your professor if you're in a lab, like, I'm thinking that this isn't right for me I want to try something else. Do those other things! I've had students who I've worked with for a semester and then said at the end of the semester, "I don't, I don't like crabs. I don't like the way they smell. I don't want to see them, like, I don't want to do this anymore. I want to work on plants. Do you have any advice about plants?" Like, "yeah! Let me tell you about the people who are working on plants, and the biology department, they're great! Let me email them! It's more about, like, are you getting the best experiences that you can? Are you learning about science? Are you learning about this?"

Courtney: That's really great advice. Undergrad is a very good time for that kind of experimentation and definitely a time to be open and honest with people if you're not feeling it.

Fun Question: Favorite form of media

Kara: We're gonna wrap up, we do have one final question for you. Do you have a favorite form of media, or maybe like a favorite book or movie or documentary series that helps influence your journey and your research training?

Maggie: For me, it's been a lot of audiobooks, because, like I said, those dissections take a really long time. And you can't use your hands, and you can't really use your eyes either. Pop out an audio book, and then, you know, start dissecting. I've gotten through Lord of the Rings, three or four times. I am huge Lord of the Rings fan though so that, I'll have to send you two the meme, that I created, it's the Eye of Sauron, except for instead of the eye. It's a crab.

Kara: *laughs* Nice.

Maggie: Lord of the Rings is just amazing. It's a heartfelt story that supports everybody. I, *chuckles* I love it. So, audiobooks, though, is my big thing.

Courtney: Is there a book you're in the middle of right now that you want to share with us?

Maggie: So there's a book called-I was gifted-called Rumo. It's about-It's a big fantasy, it's really, really cute though, and it's technically better as a book than an audio book because it's got drawings in the book so you don't see those in the audio book. But it's about a wolperting, which is, like, a little, creature guy. He's like a dog, but

with antlers. And it's about, like a. It's like a Lord of the Rings style like adventure, where he's, he, he is growing up, it's like a coming of age, and like adventure story about this little wolperting, it's, it's really cute. If you're looking for a really fun book, really uplifting, especially on a rainy day. I would check out Rumo. It's really good.

Shoutouts to organizations on campus

Kara: All right, are there any organizations on campus that you want to highlight that we haven't talked about yet today?

Maggie: Well, so I know that you guys interview Rosario and Ian (STEAMTalk, Season 2: Episodes 1+2), so I'll just re-highlight **SACNAS (Society Advancing Chicanos/Hispanics and Native Americans in Science)** fantastic.

I was gonna say otherwise, like BSSA. Biological Sciences Students Association. They do really cool things. They have a conference in the fall where they have poster competitions and talk competitions that are primarily gauged for undergrads to do, to show off their research.

And then there's **Phi Sigma**, which is the biological Honor Society. I'm so glad that I'm part of it that it's really made a difference for me, not only in terms of research funding but then, also they've done really fun trivia nights and having the like banquets and stuff it's just a good way to go out and like, meet the people who are in the program with you, because socialization is part of the experience.

The other ones I was thinking that aren't necessarily at ISU, but are in the like area or at least can be remotely accessed are, there's the **Society for Neuroscience Chicago chapter**. If you're interested in neuroscience. It has a conference where it's gauged toward undergraduates and graduate students, but they have almost always a excellent cast of lecturers to talk about neuroscience that are just, they're fantastic, and they do a lot of really good outreach as well, so they're really cool.

And then the other one that I always want to highlight is the Marine Biology Laboratory. They have all kinds of different courses that you can take that are not just neuroscience. They're also through the University of Chicago, they do Friday night lectures in the summers for the whole public, and they have an archive of all of the Friday night lectures, basically, that they've ever done. And they have amazing, scientists from, you know, beginning scientists that are just starting and are going to become really amazing scientists, up to Nobel laureates on that list, and they're all free. If you're looking for some you know a place to look at good talks on science as well. The **Marine Biology laboratory website (<https://www.MBL.edu>) is awesome. It's really fun.**

Courtney: I want to keep that on my radar for sure to share on social media when they start doing some more stuff because that's a great resource for people in our audience, as well as anybody in the who's interested in that,

Maggie: Yeah, I got to do a course there two summers ago now, and honestly, like, best experience of my life, it's six weeks of 12 hours, six days a week, of research lecture mornings, and then you work the from 12 to 11pm. Just doing different research experiments. So, it's blast, I was great time, I had the best fun.

Courtney: That's awesome. That very intense sounding! *laughs*

Maggie: Oh yeah, yeah. Three you're like, half asleep, you're just like a bunch of zombies walking around.

Kara: *laughs* Well, thank you so much for coming! We had a great conversation, and we looking forward to your seeing more of your work into the future.

Outro of Episode

Courtney: Thank you for listening to this episode of STEAM Talk. We'd like to thank Maggie Demaegd for sharing her research journey with us. Congratulations again to Maggie for winning Honorable Mention in the Image of Research Contest at Illinois State University. Check out our shownotes for links to resources mentioned in this

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episode, Maggie's contest winning image, and some carcinization memes. All of that can be found at steamtalkpod.blubrly.net

The Image of Research contest is conducted through the Office of Student Research at Illinois State University. Visit studentresearch.illinoisstate.edu for more information.

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