

## **Confluence Podcast Transcript: Becky Kendall**

**Ashby Kinch:** This is Confluence where great ideas flow together. The podcast of The Graduate School of the University of Montana. I'm Ashby Kinch, Dean of the Graduate. On Confluence, we travel down the tributaries of wisdom and beauty that enriched the soil of knowledge on our beautiful mountain campus.

**Andrij Holian:** Becky brings a particular drive to her studies. She put together a fantastic review paper that was published. In drafting up her own pre-doctoral NIH fellowship application, she got it funded, which is really pretty amazing. She is so engaged and so wonderful to work with. Summer of 2021, she mentored an undergraduate student from Puerto Rico. That student presented at the National Society of Toxicology meeting. Becky is a remarkable student and a great role model for other students.

**Ashby Kinch:** You just heard the voice of Andrij Holian talking about Becky Kendall, a PhD student in UM's program in toxicology. On Confluence, we like to highlight graduate student accomplishments.

In this episode, we celebrate Becky as winner of Best in Conference Award at Grad Con for poster presentation in a STEM discipline. Open to all graduate students, Grad Con is hosted by UM's Graduate and Professional Student Association, providing an opportunity for students to present their research and creative activity and compete for awards in five categories.

Becky won for her poster: Antidepressants reduce silica caused inflammation in lung macrophages. We talk about that project, a creative new line of research, about the possible repurposing of antidepressants for use in respiratory ailments like silicosis. Becky has a sterling graduate student resume, including an NIH pre-doctoral fellowship and several publications.

We also talk about the Bertha Morton legacy which, for Becky, means seeking out ways to address the needs of her fellow Montanans, especially underserved communities who may be suffering from health disparities. We are proud to bring you her story. Welcome to Confluence, where the river is always with us.

**Ashby Kinch:** Welcome to Confluence.

**Becky Kendall:** Thanks for having me.

**Ashby Kinch:** It's great to see people in person again. And one of the things I wanted to start with was getting the pleasure of watching you give a poster

presentation at Grad Con this year, our annual graduate student conference, uh, for which you won Best in Con. What was that experience like for you?

**Becky Kendall:** It was a lot of fun. Last year during COVID, when we just had to give an online presentation and video record it, I felt like I'm just talking in the box in the top corner of my screen, you know? And I wanted to see someone face to face and try to understand, try to hear their questions and get the feedback. So it was great to have people milling around and asking questions and being able to explain in finer detail what I've been working on.

**Ashby Kinch:** Yeah, it was a real buzzing atmosphere. There's sound all over. But did you find that you did get good feedback, get good back and forth with people who are asking?

**Becky Kendall:** Yeah, I really did. I had people who were pretty engaged and, you know, gave me points for next time on a poster, you know, what things I can emphasize and what things aren't as important. But it was great to see other people's take on what I've been working on.

**Ashby Kinch:** Yeah. And you know, what you're working on in, in your particular case is, important applied use eventually. Right? Toxicology as a field, in particular, has always kind of got its eye on important applied outcomes. So talk a little bit about that part of your research. Like what do you see as maybe one of the impacts it'll have?

**Becky Kendall:** Well, right now the research that I've been doing is kind of looking at currently FDA-approved antidepressants and how I can repurpose those in respiratory health. Right now, respiratory health is of importance in our community, in the world, really with the current pandemic. It's really opening our eyes to how respiratory health impacts the whole. And so just being able to look at these antidepressants, which we've already seen go through rigorous testing, to see how they perform in human populations, to be able to repurpose those, to combat something that you would see in an occupational setting such as silicosis. And silicosis is actually seeing an increase in, its coming back in many undeveloped countries. But even in Australia and Israel, where the safety standards are pretty strident, you're seeing an increase in these acute silicosis cases that are caused by what they think is the artificial stone countertop. And those occupations, you have the generation of huge amounts of dust, and if your breathing equipment isn't up to perfect parameters, then you're gonna get an exposure of high levels of silica and leading to the silicosis.

**Ashby Kinch:** Interesting. That's, that's a very specific applied case. But then I wanna go back a step because what's fascinating to me about your research is this repurposing part. It's not intuitive that antidepressants and, uh, you know, respiratory health will be linked. What, what's the theory behind that connection?

**Becky Kendall:** Well, antidepressants have a certain chemical structure. They're called cationic amphiphilic drugs. And so they have a weakly positive charge and it, it's able to cross through membranes. So the cell, and then the organelles within the cell, have these membranes that are not hydrophilic, so basically not water-based. So you have these lipid temperature actions, but this drug can pass through those membranes and then it gets sequestered in the lysosome. So basically it enters the lysosome and then it starts to accumulate. And because its accumulation occurs in the lysosome, that dose is gonna be higher necessarily than the dose in the rest of the cell would be. And it's able to disrupt the lipid environment of lysosome.

**Ashby Kinch:** So that's the mechanism—the disruption—that you're interested in repurposing for this other thing. How far away is this research from a kind of applied outcome? I mean, how many steps are down the pipe?

**Becky Kendall:** Well, I'm just at the point right now where I'm looking at the different drugs and seeing if there is anyone that stands out above the crowd. I'm looking at four of them, and they all seem to have about the same level of knocking down inflammation in an in vitro cell model. So the next natural step would be to move to an in vivo model in mice, and that's something our lab has done quite a bit of. So do a silica exposure in mice with the treatment of these antidepressant drugs, probably calculated based on what a human would be taking it for, for depression at [roughly] the same level. Milligrams per kilogram. You can dose it that way.

**Ashby Kinch:** Fantastic. I, I find that just very fascinating and in kind of a creative way of thinking about the mechanism that delivers the drug being the thing that you're working on, not the outcome. What brought you to UM? What was your connection to the toxicology program?

**Becky Kendall:** I graduated from Carroll College in 2003, and then I focused on raising my three kids at that point. So I took a step back from academia, ended up in Arlee for a while, and then we moved to Missoula. Kids got a little older and so I decided it was time for me to go back to school. I'd always wanted to go back to graduate school and I'd always wanted to stay in Montana. So the idea of the University of Montana and their toxicology program was a

big sell for me. I met with Andrij Holian and the toxicology program here, and I just loved the fit. I loved that they had so many resources available and I loved the academic-driven focus of his laboratory and how many research opportunities there were there.

**Ashby Kinch:** Yeah. And for listeners who maybe aren't familiar with the toxicology program here, I mean, Andrij, in particular, has a really, uh, strong track record in attracting really talented graduate students and placing them, you know, moving them forward in their research careers. I mean, very strong track record in that regard. And so you, you were kind of attracted to that high research focus.

**Becky Kendall:** Yeah, for sure. And just seeing how successful he was in placing students, how many connections he's built up over the years in the field, just around the country. So just a lot of opportunities there for mentorship and then for my future as well.

**Ashby Kinch:** So, obviously you've had a lot of success here. You won a big NIH pre-doctoral fellowship, which in your CV is a major accomplishment. But you've recently won the Bertha Morton. Did that have special resonance for you?

**Becky Kendall:** Um, it really did. I've grown up in Montana and I've observed a lot of toxicology in Montana, especially in Helena where I went to college. In East Helena, where I had my first home with my husband, we got to drive by the slag pile every day on the way into work. And the slag pile, for those of you that don't know, is just mounds upon mounds of used up material that they got after mining for copper, um, back in the '80s and prior to that. So you just have mounds upon mounds of this stuff, but it's still chemically active and it still has toxicological impacts. In fact, they had to replace all of the top layer of soil for the community of East Helena, for all those houses, so that the children could play in their yards because there's such a high level of lead. So just to be able to see that toxicology each. got me interested in toxicology and got me interested in how to make Montana a better place. And so that's the spirit I was kind of going for when I was applying for the Bertha Morton was just seeing how much she contributed to giving back to the Montana people.

**Ashby Kinch:** Fantastic. And she was a Helena citizen.

**Becky Kendall:** That's right.

**Ashby Kinch:** And so there's a lot of connections with your story, your personal story. We like to elevate that component of the Bertha Morton, that it's not just for great students, which you clearly are, but we also want to, you know, elevate this principle of service and contribution to the overall state of the state. So thank you for that. And so, obviously you're in a toxicology PhD program, you're kind of moving into the completion stage. You're gonna complete here in the next year or so?

**Becky Kendall:** That's the hope, yes.

**Ashby Kinch:** Yeah. And then what's next?

**Becky Kendall:** Right now I'd love to do a postdoc here in the Montana area and stay, stay close to home. I have three kids in high school. One's graduating this year, and the third is just entering this coming year, so, so I'm hoping four years of some sort of, yeah, finishing graduate school and then post doc-ing in the area.

**Ashby Kinch:** And so post-docs that you would continue to in some of the same research area and maybe looking at other respiratory issues as well?

**Becky Kendall:** Yeah. As I've answered questions in my research project, I've also asked a lot more. So it would be great to have the opportunity just to finish up and, you know, answer some of those questions that I'm trying not to distract myself with right now.

**Ashby Kinch:** Yeah, sure. Right. And, and your long-term career goals, I mean, what kinds of work do you imagine doing as you pivot through the research part of your work?

**Becky Kendall:** I've always wanted to work in a capacity in where I, well, to really just sum it up to make the world a better place is what I really wanna do. And the connection to human health right now with my work has been very impactful for me, and I'd like to continue to do that and contribute to overall better health, especially for underserved populations. I see respiratory health, especially, as intriguing to me, and I'd love to continue to pursue that.

**Ashby Kinch:** And the mapping, the mapping of underserved communities and respiratory health problems is kind of close, right? That a lot of communities that are experiencing high rates of health problems around respiratory health...

**Becky Kendall:** Right, right. There's often a socioeconomic role in that exposure. So I'd love to be able to, I guess, illuminate that more to try to see changes happening there.

**Ashby Kinch:** Yeah. And you mentioned the pandemic as one of the sort of subtexts on respiratory health. Have you done any particular Covid-related research?

**Becky Kendall:** I have not. I've looked at the literature and seen how they have used some of these same antidepressants that I'm using and looked at Covid outcomes, specifically just epidemiologically, going back and looking at the records after the fact and seeing the rates of morbidity and hospitalization in patients on these antidepressants, and they've seen a reduction in those. So, I mean, it's just underlies the fact that it could be something in the respiratory environment that you're able to change with antidepressants that makes it beneficial. to combating the virus, this virus and others.

**Ashby Kinch:** Yeah. And that's, it's one of the things, um, we've talked about a lot on campus and in, in research circles that Covid's has been horrific, you know, we've paid an incredibly high toll. But the way we've mobilized the research community around addressing it has led to an incredible investment in a very short period of time and a lot of research. So a lot of minds are thinking it through. And so it's, it's kind of interesting to hear that wrinkle. That's another one of these wrinkles that, um, out of this you may get data that you otherwise wouldn't have had, uh, that allow you to track a different problem.

**Becky Kendall:** Right.

**Ashby Kinch:** Really interesting. Well, thank you so much for joining us on Confluence.

**Becky Kendall:** Thank you. Thank you for having me.