The Taproot Podcast

Season 5, Episode 5

Guest: Aman Husbands

Hosted by Liz Haswell and Ivan Baxter

Transcribed by Jo Stormer

[Theme music]

Ivan Baxter: Welcome to the final episode of season five of The Taproot Podcast, where we dig beneath the surface of a scientific publication to tell the stories behind the science. I'm Ivan Baxter.

Liz Haswell: And I'm Liz Haswell. For many of us, what came out of 2020 (and I guess you could add January of 2121) was a realization about how much in our world needs changing within academia, within our government, and within the patriarchal and racist culture we live in. Many of us are newly invigorated to fight for justice and for change, but it can be hard to know exactly what we are being called to do.

Ivan: Today's guest, Aman Husbands, has thought a lot about this and he talks here about how he is working for individual and system changes within his lab and his local government. We also discuss pivoting your lab focus to roll with what life gives you. We actually recorded this episode last week because our minimally competent audio engineer – which would be me – made a pair of mistakes on the original October recording that made the tracks unusable. Fortunately, Aman was gracious enough to rerecord with us, for which we are *supremely* grateful. And with that, on to our episode.

[Theme music]

Ivan: Today's guest is Aman Husbands. Aman is originally from Canada and got his undergraduate degree from the University of Toronto. After doing

his PhD at UC Riverside with Patty Springer, he moved to Cold Spring Harbor to train with Marja Timmermans. In 2018, He moved to the Department of Molecular Genetics at *The* Ohio State University, where he is an assistant professor – or, as he recently put it on Twitter, a "probationary professor". Aman's research group studies developmental patterning in leaves. Welcome to The Taproot, Aman.

Aman Husbands: My pleasure. Thanks a lot for having me.

2:38 **Liz:** We're so happy to have you here. So today's paper is titled "Identifying cancer-Relevant mutations in the DLC START Domain using Evolutionary and Structure-Function Analyses". The first author is [Ashton S] Holub and this paper recently came out in the *International Journal of Molecular Biosciences*. So Aman, you wanna give us just a little short/brief/quick overview of the paper?

3:04 **Aman:** Yeah, absolutely, thanks a lot. The goal of this paper was to basically identify residues that might contribute to the function of a tumor suppressor which is called DLC-1, or *deleted in liver cancer-1*. These DLC proteins function in a number of different cancers and they suppress proliferation, invasion, and metastasis of tumors. They had this multi-domain structure and as part of that structure they have a START domain - the *steroidogenic acute regulatory transfer* domain, so we just call it START domain. STARTs have these characteristic helix script fold structures, and a common theme about them is that they bind hydrophobic ligands, like sterols or fatty acids or carotinoid. So for the plant people for some context in plants, the ABA receptor for example is a START domain. Our long-term goals to figure out how the START domain my regulators these DLCs; it's basically like a built-in pocket that might be really well suited for drug targeting. That sort of our long-term goal.

But the specific goals of this paper was just to identify residues in that START domain that might in some way contribute to function. We did

this basically using the combination of evolutionary and structure-function analyses and this huge publicly available dataset which is called COSMIC - *Catalogue of Somatic Mutations in Cancer*. COSMIC is basically like thousands of sequenced individual tumors from all these different tissue types and basically we were looking to see whether we had any mutations that were piling up inside the START domain, and that might give you an indication of what might matter for function. We saw that there were mutations there, but there were no obvious kind of hotspots; like no residue really jumped out at us as something that might be important. We figured maybe this is because mutations were accruing in these conserved residues that are really going to be spread out if you're looking at something at the primary amino acid level.

So we collected 120 sequences, 46 different vertebrate species spanning 450 million years of evolution, and we do this really stringent multiple-sequence alignment. What we get is about 20% of those residues are really, really highly conserved, and then we see in fact that those mutations are indeed preferentially occurring actually in those conserved residue. We then did some structural modeling to see what these residues might be doing and therefore what might be happening. Indeed we see that they're forming lots and lots of interactions at that tertiary level, and that mutations in COSMIC that we see might break those bonds; maybe that's why you're basically seeing this over-representation in this database of cancer. These have been validated actually; previously a couple of these mutations have been validated by other groups so that also gives us comfort that we're actually identifying a nice high-confidence set of residues to start working with - what do they do, the structure and partners, ligand-binding, subcellular localization and so on. We now have basically a nice start on this project.

Liz: Nice pun there. Well done.

Aman: Thank you, thank you!

[Laughter]

Liz: I feel like you might've used that before.

So you've got all these like candidate key residues, right, for vertebrate proteins. I didn't really introduce this, but your interest is in plant versions of these proteins. Are a lot of those conserved in the plant, lineage, also?

6:13 **Aman:** That's a good question. I had looked at that and it's basically a "yes" and a "no". The conservation kind of falls off so even if you look at vertebrates (which is 450 million years), you only have about 20% of these resides that are highly conserved; and it falls apart even more than kind of the further away and evolution you go. But I think really what it's about is forming that structure - that helix script fold structure; it gives you this deep hydrophobic pocket that lets you bind these ligands. So basically as long as you end up forming that structure, there's a lot of tolerance to what these mutations are.

Ivan: Obviously you could only do this because you have this *huge* database of information from the human cancer world. I get the sense that that just dwarfs the kind of information that is available to plant scientists. Was that a different paradigm shift for you?

7:04 **Aman:** Yeah, absolutely. To somehow benefit us, as well (to come back to Liz's question), can we actually transfer some of that information? Maybe clearly with a different question - I'm not trying to solve cancer in plants just yet.

It's a good question. It requires a different way of thinking about things. We're very much, "Let's cross it and we'll go to the third generation and see what happens." But, you know, the cancer people are not thinking like that at all. They're very much like at the level of the patient, "What can you do right now?" So it is a very different way of thinking about it.

Liz: Can you maybe talk a little bit more about the ways in which doing this project enriched (or you see will enrich) your research into the plant START domains?

7:44 **Aman:** Indeed, exactly. I mean, some of this is sort of funding - the idea that you need to access multiple revenue streams, which is what they come to. But from a scientific standpoint . . . man, that's such a hard question. How has this specific project enriched our plant stuff? Well, it's money, honestly. A lot of this is money.

Liz: Well, Aman, this paper is a great contribution to the literature and is going to lead into all kinds of interesting and new lines of research for you and maybe for other people in your field. But as I alluded to earlier, working on cancer biology seems like it might be something new for you.

[Laughter]

Also, maybe doing bioinformatics seems like a little bit of a departure. How did you go from what your interests were earlier to developing this project and also how did you recruit lab members to do something like that?

8:41 **Aman:** I was at Cold Spring Harbor for post-doc, so it's not just plants; it's many, many different . . . I went to talks on autism and cancer and neurobiology. I've always had this interest in the science more broadly, from the perspective of model systems. But what I've always worked on is these HD zips - these class III homeodomain-leucine zippers. These have a homeodomain and then also START domain, and that are these really critical developmental regulators in plants that are involved in multiple different facets of plant development. This idea proposed by Kathrin Shrick in is that maybe these are sort of like animal nuclear receptors. Maybe their transcriptional activity is directly regulated by some lipophilic ligand. And even when I was in Patty's lab as a PhD I was like, “That is so interesting.”

I've always been sort of interested in it from that angle. But being at Cold Spring Harbor, I started to take a step back and think, "How can this one domain (which is basically a little pocket) do all these really different things?" You could imagine that maybe it does the same thing in every protein, right? Homeodomain binds DNA; that's what it does.

Liz: Right.

9:47 **Aman:** But START domain seems to have not just different biological functions, but different regulatory mechanisms. Sometimes it's transferring liquids between membranes or it's modulating protein-protein interaction, or it's stabilizing proteins. How can one domain do all these different things? I've just found that really intellectually interesting.

Then I come to OSU and I joined this grant-writing group with mostly cancer biologists, which again is cool because you have to talk about your plant stuff in a way that gets these sort of broader ideas across to somebody who does not know what xylem or phloem is, at all.

[Laughter]

This was definitely fun to do, and it was an intellectual challenge for me to do. The person leading the group, Rick Fishel, here had suggested, "Why don't you become the START domain guy?", so to speak. I'm interested in how this domain could regulate the transcriptional output of something, but I'm also super interested in how it could regulate other proteins - like these DLCs, which are Rho GTPases. That is probably a different regulatory mechanism, but still with that same underlying idea that you would bind to a ligand and that sort of does something that gives you this control over things - which has a developmental biologist, that notion of integrating signals is very interesting.

So that's kind of what got me thinking about it and I'm like, "Well, yeah, but you can't just, like, *do* cancer. You really need to come at this and with mentors and with a plan and all that." One nice thing at OSU is

Pelotonia; it's like a bike ride thing. You get people to sponsor you for the bike ride and they raise money for cancer research, and then that funds undergrads, grads, postdocs, and even at the PI level. Me and my grad student put in for a fellowship for that and we got it, so that's a couple of years of funding. As a new PI you need to really not just write grants, but also diversify those funding sources. If you can have multiple funding streams coming in, that really makes your lab a little bit more resilient to these ups and downs, and the occasional global pandemic.

Ivan: Occasional?

Aman: Once a century is enough.

Liz: I don't like the framing there, at all.

[Laughter]

11:55 **Aman:** I think the first is that my department is not plant-specific. We use multiple model organisms, and so therefore we tend to recruit students who are sort of okay with the idea of branching out a bit. I think more importantly than that I really have made a conscious effort and I've been lucky to recruit students that believe in my lab philosophy, that we're a supportive and collaborative lab. We make it, or we don't make it; it's really as simple as that. So my grad student Aston Holub who's first author on that paper, he has broad interest as well but was really enthusiastic about the challenge of writing for that fellowship because he understands why it's important.

Liz: It seems like either you're like a wizard and you already knew that you were going to need to pivot to bioinformatics, or you were able to take advantage of opportunities that were in front of you. Tell us a little bit about how that all happened.

12:45 **Aman:** I'm not really a bioinformatic person. This was just not what I was really trained to do; but I had a student who was willing to learn, I was willing

to learn and we had this Pelotonia, which actually we didn't even know we were going to get this at the time. We basically said, "What can we do to make the best use of this time?" So we start writing a review with some of my students, working on a mathematical modeling paper with another student. And with Ashton, it's like, "Well, look, if we don't get Pelotonia the first time, it's okay, right? We'll work on this paper." I have another colleague here, Ruben Patreaca, who really put me on to this COSMIC database. He's actually also an author on here in, and Ashton is a second first author paper with Rubin as the senior author. So we were actually really made hay with this.

Aand Ruben was like, "Well look, use this COSMIC database. If you want to get into cancer, then I think you're gonna need to establish a foothold. We got to show them that you know what you're doing. The data is out there. Here's how I analyze it." Then I brought the evolutionary kind of structure-function perspective, which he hadn't thought of, and it was just this nice combination that really came together. We had to do something, otherwise you're basically sitting at home for months and you're just burning money. We didn't spend money on supplies, but I mean you guys both know the major of a lab is salaries. So how do we keep students motivated and engaged and push forward their career, push forward my career? It's a tough time.

This paper and this project I think was a nice way to bridge that and I feel like it's actually going to take off. We have this funding to do this and we can generate this preliminary data; now I can start putting in for RO1s. It came basically by pivoting from a bad situation. I'm trying to make the most of it.

Liz: I think a big part of what's impressive to me about how you did that was, I mean, you had this opportunity out there that you grabbed. Part of it is thinking like, "Okay, I need to think more broadly." But another part of it was that you were already casting about. It's like . . . what do they say? "Chance favors the prepared mind."

14:43 **Aman:** That's But yes, I completely agree on that; that's the right way to do it. You want to do exciting science and there are multiple systems to do it in multiple agencies that that would be willing to sort of fund exciting science if you're willing to take a chance.

Ivan: You have to be flexible. You have to go find funding. You have to have good questions. But one of the things that I always worry about is getting myself too far on that path and forgetting the core things I care about and still wanting, "This is what my lab does that matter most to me." I definitely don't want to hear that you're like leaving plants because all this great cancer stuff you can do.

Aman: Never!

Ivan: Okay, good.

[Laughter]

15:27 **Aman:** No, you're exactly right, and it is indeed a tension. I think that's exactly right and I think the question is, "Are you interested in what you're doing?" Right? That's really the key. Do you really like the scientific questions? And I do. I really do I find. This question of, "What is this tumor suppressor doing?", I mean, it's good that we can try to sort of leverage some NCI money - don't get me wrong - but I would not study this if I was not interested in it. There are other proteins I could've studied that had the START domain, but there's something about this that I found really . . . what a challenge, man. It is funny. Plant biologists, we tell people what we do. They're like, [funny voice] "Why do you do that?" It's annoying, but cancer people never have to deal with that. So it is sort of funny to get a different reaction when you talk about your science.

But to me, it's regulation. I mean, this has embryo lethal phenotype. So from a developmental standpoint, I know that this gene also matters as well. It does hit those higher level things for me that I find interesting

and in some ways plant people, we call ourselves "plant people" and I still totally do it. But we answer . . . Liz, you're talking about mechanosensitive proteins. That's not a [unclear] thing, right?

Liz: No, no, no.

16:35 **Aman:** This is a system to study this really interesting question. I think that's a good way . . . it's hard to break out because obviously I did my PhD in Riverside's Botany and Plant Sciences department, you know what I mean? So it was going to Cold Spring Harbor and just seeing people can use the same techniques and actually be asking really similar questions in what looked like wildly different systems, that have different cultures built around it. But Ivan, it's funny you say would I leave plants? No way. I *love* . . . the plant community for the most part is super cool and friendly and the vibe has been nice since undergrad, and I do not know that I would want to just go swim with the cancer sharks. Good lord. I think there are ways to do this that allows me to scratch that scientific itch and also be able to fund the lab. I always say that my responsibility is to the lab - to the people here - but also the people who come next. That means, indeed, securing funding and securing and trying to be stable even though, man, that is challenging. So as long as I don't ask questions that are too far outside of what I find personally interesting, then we'll be okay. Because it's easy to get the fellowship, but then you need to do it. You know? I mean, we were high-fiveing and you got the fellowship and it's like, "Well, shit, man, I need to do cancer for two years."

Ivan: I've a couple of times sort of gone down the road of starting to write a grant with somebody or being part of a consortium and then realize that, [tentatively] "Uhhhhhhh"; when I sit down and look at it, it's like I'm not actually excited to do that work. I think I should probably back out, but it's hard because you want to be open to new ideas and you need to be open to new ideas. You need to be able to explore that space.

Aman: Yeah, I think that's exactly right, but you would also have that in the plant world too, right?

Ivan: Oh, sure!

Aman: There's a lot of plant projects that I have no interest in doing it. So indeed it's tuning what you do to what you enjoy doing. I agree with you on learning new stuff.

Ivan: I want to go back to this grant-writing group cuz that seems like that was really helpful for you. There are also, I think, people who have goal-setting groups and paper-writing groups that have been really helpful for them. So tell us about this group and how it started and what it's about.

18:57 **Aman:** Oh yeah, I cannot stress that enough how valuable this has been. It's basically new Pis / junior PIs and there are there's someone here whose name is Rick Fichel. He is a signal molecule person; this is how we first connected. I had done some signal molecule work in post-doc, and he's obviously very successful. He's got multiple RO1 grants and he said, "Alright, I'll teach you and a a couple of your fellow colleagues," (including Ruben who I had mentioned), "Well, I'll look at your grants. Show me some of your specific aims. We'll meet Friday 4pm and we'll go through it and we'll see about the changes." It was just night and day. If we look at some of my earlier work, I was writing like Charles Darwin, these like paragraph-long sentences; and none of it was clear and "What are your objectives?" and all this.

It was just really nice to have multiple people (not just your peers, but somebody who was a successful grant-getter) to do this. And, you know, NIH people also write their grants slightly differently than NSF, so that was also cool in a way. It also kind of keeps you on a schedule. It's very easy to drift and start prioritizing other things because yeah, grant writing can be a slog sometimes. Just knowing like, "In a week or two, I'm up and I need something there." They are super valuable.

Ivan: I can't emphasize enough (and this is true for PI grants, for student fellowships, for postdoc fellowships) how valuable it is to have someone who is *not* in your group read your grants, because those are the people who are going to be in the panels that read your proposals or your grants - people who are not in your field, basically. We way too often tend to write for the people close in our field, and it's that getting somebody who's a little bit farther away to actually give you their perspective.

20:50 **Aman:** Yep, I think that's exactly right, and also to write simply, as well. I imagine it's pm and someone has to read your grant; they've already had a long day. Do you really want to piss them off? Or do you want to just really clearly/cleanly say what you're trying to say. And you just do it.

Ivan: Yeah. Just get right to the point. "Plants are sessile."

Aman: [Laughs heartily] I start everything with that. I use the word "sessile" as often as possible. "Sessile" is a *no*, and "elucidate" is a *no*.

Liz: How about "interrogate"? Do you use "interrogate"?

Aman: Well, I will now.

Liz: Yeah, and also please be sure to start every other sentence with "interestingly".

Aman: [Laughs] No, it's so funny you say that because Rick was like, "You're trying to sell me a car here."

Liz: [Laughs]

21:38 **Aman:** It was kind of true. I read them over and I'm like, "interestingly", "intriguingly", "remarkably". If it's remarkable, it's remarkable and they'll know. If you have to say that maybe you haven't framed your question in a large enough way, or maybe you need to take a giant step back.

Liz: The discussion of whether to use these sort of elaborate words, it's interesting. I was started trained not to do it at all, but I think that there are cases where they actually do a really good job of telling the reader what you think about your data, and that's not always bad. I just think they just have to be used judiciously.

Can you talk a little bit more about how you deliberately create an atmosphere in your group *and* how you were able to use that to keep everybody above water during especially the early stages of the pandemic when everybody was really struggling to figure out what happened next?

22:36 **Aman:** Thank you for saying that. I feel that gif . . . you know that *Community* gif of Troy walking and holding their pizza and everything's on fire? That's kind of how I feel. So it's cool to see that you think that I have it in hand.

Liz: [Laughs]

Aman: No, you're We have to all pull together, and so we would just have to recognize that it's an odd situation, recognize that your productivity is going to go down, and that's just all there is to it; and if there's ways you can get around it, there's ways you can get around it. But I think you got to start by actually changing your expectations - not saying that you will and then holding people to that same standard. If you're gonna do it, then you gotta do it. I think it was just checking in as often as I could and, again, if something doesn't get done, it's okay. We'll get back into lab, and we actually did. Martin, he got in at a pretty reasonable time - I think by June-ish or maybe early July. I think we were starting to get back in there at lower strength. And even then I'm like, "It's fine. Let's just prioritize what we need to get done." If we can get some writing done, that would be great. Let's just set some benchmarks.

Liz: Tell us how you're doing that.

22:38 **Aman:** I have always had the open door policy. Basically the philosophy of my lab is that it's a supportive and a collaborative environment. Full stop, so I think we're building something. The key I think is giving them my intentions and what I want and *why* it matters. I always explain why something matters. You're asking for specifics, but now that I'm back in there it's an open door policy. I talk to my people every day - multiple times a day - about the projects that are going. They come in, they're handing me gels for PCR all the time, and I love that. Like, "Oh yeah, let's try this," "Let's troubleshoot that." There's a real constant, consistent, communication between us that was there before the pandemic and is there now.

During the pandemic was harder because, in some ways, what are you going to talk about? So giving people a little more space was what I did. We check in once a week, for example, as a lab and we'd have half an hour lab meeting. I didn't do journal club, for example, during that time. It's like, "It's okay, these papers will still be there." You can read them again later, you know? When I say it changed expectations, it really was that. It's just checking in, "How's everybody doing?" That should be the first question that you ask. Then the goals would be, "Let's try to get these papers out by the end of the year. How are we doing on that?"

Liz: I'm just interested in how it's easy to articulate your lab mission or lab vision but then how boots on the ground you actually convey that vision to the people in your group, I think feels like a whole other . . . can of beans? Bag of worms?

25:19 **Aman:** Yeah! Intentions will always tell people what what the experiment is for, why it matters, where does it fit in the larger goal. If you're pushing them, it's because I have a grant that I'd like to get out of this time and this is the piece of preliminary data that I think is really going to support this, so there's buy-in. We are doing this together. We make it or we don't make it, and if we can do this (if we can bring in money) then people don't have to TA. That you to now focus focusing in on this. We

do this, we can now travel to go to a conference; so this has to be something where we are working together, rather than you are working for me. It just comes down to every single day, just talking to people, "How's it going? Are you running into any specific problems that I can help?" Open door policy, multiple meetings per day, basically. If I need to work from home, I'll work from home, but I try to actually minimize that. I try to sort of be physically present because if you're there, yeah, it sort of follows from you a little bit. Don't say something; you need to actually do it. Otherwise they'll call you on bullshit.

Ivan: It's interesting because I really haven't gone in at all, basically, and have turned my office into a space for people to take a break, with walls where they can take off their mask and have some computer time so that they can space out more. We tried a little bit meeting people outside when the weather was nice, but it's currently 10° Fahrenheit. I'm not going to have an outdoor meeting right now, so it's it really is all over Zoom in my lab.

26:55 **Aman:** Zoom is not the best, I know it's such a barrier. If that was the only way of meeting people (which is how it was in the pandemic), you really feel separate from them. There's just no substitute for actually going to lab and seeing them there, people working. We're socially distance and all that and everyone has masks, but it is a big difference. You feel like you're actually part of that same group again, which is the hardest part of all this. You feel like you're almost working . . . for what? Where's the end? What's the point of this, you know? Unless you clearly articulate where you're going, it's very easy to just kind of lose motivation.

Liz: You were just referring to the ways in which sort of being a new PI, and then you add onto that the pandemic. Then something we haven't really talked about is what happened over the summer with protests and racial reckoning regarding police brutality against people of color. I feel like that probably also added to or synergized with your other stresses. You want to tell us a little bit about what you think about all of that and how

you manage that as well?

28:04 **Aman:** Oh yeah, I listened to your recent podcast with Thelma Madzima and she just did a fantastic job articulating that; I think it's exactly right. Everything just sort of compounds on you. In some ways, you're glad that there's this energy out there and that's something that might actually change. And then in other ways, it's really demoralizing. It's just a symptom of society that's really kind of sick right now. Not just pandemic-wise. I mean, there's really something fundamentally wrong and I do really think about that. How can I make a contribution? What can I do? Increasingly I think, these are systemic problems and systemic problems require systemic solutions. In some ways it's unfair; it's almost unethical to ask individuals to fix these problems. I think that is actually a conscious strategy of many of these institutions.

Liz: One hundred percent.

28:51 **Aman:** Police, universities, electoral politics, people, whatever. The goal is to atomize you - to basically say, "You are individually responsible for these things." So in a way I think the solutions need to come from things like labor movements and from organizing - from that way of thinking about "us" as a group with a specific demand that we would like to do and like to solve. Those systemic problems, I think are going to require indeed banding together and coming down to systemic solutions rather than at that individual level.

Ivan: So what does that look like? What does that look like to you at Ohio State? You are a large state university in a very reasonably red state like Liz and I live in, where there are these countervailing pressures at the community level, at the state level.

Liz: And people like football a lot, I heard. [Laughter] I heard about that.

29:45 **Aman:** They're playing in a stadium in a pandemic. I mean, what are you guys doing?

Ivan, to come to your question, yeah, it's a good point. I cannot solve issues at Ohio State and it's not that Ohio State is uniquely bad. I think it has the classic problems of a large institution. This is just what's going to happen where these incentives are aligned.

I think about this two different ways. The first is how can I address that on the individual level? What can I personally do? A program that I'm putting together is targeting Newark (Newark is a regional campus of Ohio State), and I'm forming *Columbus Campus Research Opportunities* – CCRO. The goal here is to pay three students per year in the summer to come to do research in the lab (sort of like an REU) and they'll get housing, they'll get paid. So this improves their material conditions. You don't have to make the choice between doing research and putting food on your table.

Then they'll join up as part of this consortium which is this group of other summer programs, and we're all banding together basically. We'll be over a hundred students that would then eat together, live in the same place, and put on a joint research symposium at the end and poster sessions and all this. This basically gives these kids (and I'm targeting primarily Black students) this opportunity to come to main campus and do that RO1-level research and tap into this large community of like-minded undergraduates. So that is one way that I can fix or help address needs of - let's say - three to nine individuals. That individual level.

The second is that systemic question and it's really much harder one. I think if you see my Twitter, you'll see I guess what I've chosen is defunding the funding the police. That, to me, feels like a a concrete goal that I would like to work towards. I was shocked that more than one third of the budget of these major cities goes to police; add that to fire, it's over 50%. They're being asked to do a lot that they're not supposed to do. If a lot of that money goes towards funding people like mental health experts so you don't shoot somebody who's having a mental health episode. A guy with gun is not the solution for many, many

things. And this notion of "crime will go up" and "the police solve all these things", they actually don't; they do not solve a lot of these things. We're spending so much money and I think we're not getting very much back and we're damaging trust in the community.

For me, defunding the police is a concrete goal that we can work to. And it's ironic actually, that given that I'm pro-union. They have such a strong union; it's almost evidence in a way that a good union can actually really protect its members. I just wish they would use it for good.

So what I've done then is I put in my application for Columbus Civilian Review Board. My colleague actually Zakee Sabree put me onto that; he's a professor in EEOB [Evolution, Ecology, and Organismal Biology] Department. I'm hoping that they choose me for that; over two hundred people actually put in their application, so there seems to be a real, real hunger to actually have more police oversight, and we'll see if that actually translates into something. But on my application, I was very clear. I also said I think that until we really address the enormous power that police unions have, I don't see us resolving that. This is a systemic problem for a reason. It's just wealth getting extracted and then concentrated into regions over and over and over again, and a lot of people are in a bad way. I cannot fix that obviously, but I'm hoping that this is one specific area that I think is particularly egregious and that maybe there's a way I can make a systemic contribution. Then we couple that to the science, to the research side of things, that's where I could maybe make an impact as an individual.

Liz: I love your perspective on this idea that we need to be thinking systemically rather than individually.

I want to loop that back to everything you were just discussing about how you lead your lab. When you lead a lab, that's a place where an individual actually has a great amount of power, and so I wondered if there were ways you were talking to your lab members about racism and

about anti-racism, or if you have sidestepped that. How have you handled that?

33:57 **Aman:** I always tell people, "Culture is going to develop in your lab, one way or the other. The question is do you want to have an active role in shaping that culture." It's going to happen, and so for me it comes down to that supportive/collaborative idea that you help everybody - that we all help each other. I think if people really buy into that, it is very easy.

These sorts of problems don't emerge as often, I would say. Do I talk specifically about these issues? I never censored myself, I would say it that way. I haven't done things like, "We're having a lab meeting to talk about these issues directly and everybody needs to prepare this and this and this and come to me with that." I think it's more sort of organic, organic discussions about it as it emerges. I never feel the need to censor myself or anything like that. Yeah, it's a good question. Maybe I should actually start to think about other more direct interventions that I could do.

Liz: We had one lab meeting to discuss basically anti-racism work that we could do as scientists. It was only one, though. I know other friends have sort of regular tea hours where issues of racism in science are discussed like on the regular.

Aman: Yeah.

Liz: So there's obviously a range of ways to approach it. Ivan, have you done anything deliberate?

Ivan: The day in June (the scholars' strike), I encouraged everyone - said I was taking a day of reflection and encouraged everyone and had several follow-up meetings with people where we talked about what we had read, but not as a whole group. Going back to what Aman said about Zoom being really hard, this is one of those things where I don't feel like we have had really deep discussions about *anything* as a group over Zoom.

Some of the science discussions have . . . it's really hard. I do feel like we can have smaller one, two, three person conversations over Zoom and still really get into something, but -

35:55 **Aman:** It's not organic, you're totally right. It's a terrible format. It's a terrible format to build those quick back-and-forth. It becomes about structuring some points that you need to get across if you can. Put these things will cross my desk and I'll always bring it up. It just kind of comes up because somebody is there. I'm like, "Can you believe this shit?" And then your discussion sort of starts from there.

It's very present in my lab, I think, because I am very hyper aware of it and then I'm not going to censor myself. Other people will be aware of it too. But yeah, I feel you on zoom. I don't know that that's the best way to do it. It might also breed resentment that you're being forced to sort of talk about this rather than seeing how it affects somebody else and then changing your behavior accordingly. You know?

Liz: Yeah. We do a lot of talk on Slack, actually. We do a lot more messaging now than we ever did, and I feel like that's a way we're communicating a lot.

Aman: Us too, totally. I love Slack, actually.

36:52 **Liz:** I think the one theme that's running through this whole conversation is almost like this individual determination and really evaluating what your (this is a very Beronda [Montgomery] thing) . . . determining what your mission is and then what parts of everything that's being asked of you [that] you can - but also you want and feel is part of your personal mission to do. I feel like that's sort of the theme that's going through this whole conversation, whether it's about answering scientific questions or leading your group, or really trying to change academic science or policing in your community for the better. And what I love is . . . I mean, one of the things that I find so admirable about you, Aman, is that you

are already so far on that pathway for such a young person.

I feel like when I was your age, I was just really chasing what I saw other people admired rather than deciding for myself what I admired and wanted to be. That's the thing that I think is so cool about you, is I can see you deciding for yourself how you want things to be and how to make them happen. I hope that people who listen to this will get the same and be sort of motivated to sit down and think the same for themselves.

38:26 **Aman:** I appreciate that, thank you so much. That's really nice to say.

Ivan: Alright, well, I think that sounds like a great place to leave it. Aman, thank you so much. If people want to get ahold of you, what's the best way for them to do that?

Aman: Oh, yes, Twitter probably @AmanHusbands, or husbands.6@osu.edu. You just Google me, there's like one Aman Husbands on earth. [Laughs] Should be easy to find.

Liz: And hope you like animated gifs, cuz you will find some there.

Aman: Me versus Justin Walley is going to be some of the best gif games. But thank you so much for the invitation to speak. It's been really nice. I really love the series, and super fun this year. It's been a really good one.

Ivan: Well, it's been our pleasure. And Liz, how can people reach you?

Liz: Twitter is also my game. You can find me there at @EHaswell.

Ivan: You can reach me @BaxterTwi, and you can reach the podcast at @TaprootPodcast.

Aman, thank you again and we wish you the best of luck as you continue your awesome progress.

Aman: Thank you, thank you! Thanks to both.

[Theme music]

Ivan: The Taproot is produced by the hosts, in collaboration with the Plantae team of Katie Rogers and Mary Williams at the American Society of Plant Biologists. Jo Stormer provides our transcripts.

Liz: We are going to take a break now and aim to get back with a new season this summer. If this is the first season you're listening, we urge you to check out our back catalogue on your podcast listener of choice. Thank you for listening to this season.

Stay safe, and we'll get back to more stories behind the science soon.

[Theme music]