Just the Biology and DNA Portfolio.mp3

Introduction [00:00:05] Now, this is recording, RTI International Center for Forensic Science presents Just Science.

Voiceover [00:00:18] Welcome to Just Science, a podcast for justice professionals and anyone interested in learning more about forensic science, innovative technology, current research, and actionable strategies to improve the criminal justice system. In episode four of our 2021 NIJ R&D and Beyond mini season, Just Science sat down with Tracey Johnson, a physical scientist and program manager in the Office of Investigative and Forensic Sciences at NIJ, to discuss the NIJ Biology and DNA research portfolio. Although Tracey Johnson is relatively new to NIJ, she has a depth of professional experience from which she can draw. As a 20 year veteran in the field of forensic DNA analysis, she is no stranger to the needs and gaps in the discipline. Listen along as she discusses her career path, the intersection of forensics and other scientific disciplines, and the NIJ Biology and DNA research portfolio in this episode of Just Science. This season is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Here is your host, Donia Slack.

Donia Slack [00:01:27] Hello and welcome to Just Science. I'm your host, Donia Slack with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. Today, our guest is Tracey Johnson, a physical scientist who oversees the biology, research and development portfolio in the Office of Investigative and Forensic Sciences at the National Institute of Justice. Tracey, welcome to the podcast.

Tracey Johnson [00:01:48] Thanks, Donia. I'm glad to be here.

Donia Slack [00:01:50] According to your bio, you have come to the NIJ here recently and you have more than 20 years of experience in the forensic DNA analysis world. So I was hoping maybe you can give the listeners a little bit of your background and maybe your career journey and how you landed at the NIJ.

Tracey Johnson [00:02:07] Sure. I kind of came to forensic science by accident. I was getting my degree in biology, but wasn't really sure how I wanted to apply that information. Originally, kind of thought that maybe I would go to med school and then I thought I would teach. Neither one of those things seemed really correct for me. And then I sort of had this amazing opportunity to go and hang out with my sister, who was in Hawaii at the time. Her husband was stationed there. But while I was there, I had the opportunity to meet some folks at the JPAC CIL laboratory where they were doing forensic anthropology on service members with the hopes of identifying those service members. And it sort of really struck a chord with me at that time. And so I read some books by Dr. Ubelaker and others about forensic anthropology and then kind of realized, oh, wait, there's this whole field of forensic science where I could take my interest in biology and actually see an application of my techniques. And so I joined a laboratory in my senior year as a research assistant and was able to begin to learn some of the molecular biology techniques like Western blotting, PCR, transformation and all those other kinds of cool techniques. That was when my forensic journey really began was my senior year in college. And then from there I went to grad school for forensic science and sort of fell in love with the idea of being able to use my interests in biology to be able to apply that in a real world sort of setting. And so I spent about 12 years at the Armed Forces DNA Identification Laboratory. When they moved to Dover, I decided to stay. And so then I worked for a biotech company for about seven years. And then after that, I really wanted to sort of broaden my influence beyond the sort

of local impact that I was having on the laboratory and the staff that I worked with. And so I was looking for an opportunity to sort of change that scope of influence. You know, typically you might be able to do this through organizations like OSAC or SWGDAM or ASCLD or AAFS. But those opportunities really weren't available to me because we had a pretty narrow mission set and I didn't have much time available in my current position. So I started looking for new opportunities where I might be able to do that and the position became available at NIJ last year and I applied and that's how, you know, I joined NIJ.

Donia Slack [00:04:48] What's really interesting is, and you don't hear it often, is that you actually it sounded like you got a degree in forensic science early on. So your graduate degree is in forensic science?

Tracey Johnson [00:05:00] That's correct, yes.

Donia Slack [00:05:00] So, I mean, I know programs, there are a lot more programs now in forensic science, but I know years ago the programs were not that plentiful. Right? There were like, what - none, few, five?

Tracey Johnson [00:05:11] There were four. There was George Washington University. There was John Jay. There was University of Alabama and there was Marshall University.

Donia Slack [00:05:21] You know, one of the things I was hearing there is that you started early in forensic science and you worked for AFDIL, probably one of the more notable places to work, especially when it comes to some of the advanced methodologies for degraded bones, and one of the first to implement some next gen sequencing. I mean, that's fantastic. But then you took a seven-year hiatus. So I kind of would love to hear your experience in this biotech company and maybe how it might have helped, even, when you've come back to the forensic sciences. Were there any lessons learned of how maybe other sectors are applying science?

Tracey Johnson [00:05:55] It was a pretty unique opportunity because, you know, there are a variety of departments within the company that I was working for - engineering, there were folks that were doing sort of bioinformatics. There were folks that were doing, you know, assay development for veterinary applications. So it was a pretty broad scope. I mean, our mission set was, like I said, it was kind of a narrow focus looking at development of assays for human identification and familial analysis. So, you know, we were investigating different techniques to be able to do that. My role was really more as a laboratory manager. So I was managing staff, managing the equipment, managing the reagents - those kinds of things, which, you know, if you've worked in kind of a larger laboratory that can consume an awful lot of your time and so you're not getting a chance to do as much of the science persay because you're coordinating training or you're coordinating the monthly quality control that needs to happen for the instrumentation or planning on ordering for the year for a six month time period. And it was a great experience. It wasn't necessarily, I don't think, fulfilling in the same sort of way that I was looking for in terms of like sort of that broader influence, having an opportunity to sort of come back to the science of the things that I really enjoyed.

Donia Slack [00:07:23] So, you know, you've come from a practitioner background at AFDIL and I think some of the best researchers, I think, are ones that do come from that practitioner mindset because they know exactly what is realistic. Research can be fantastic, but sometimes it's so blue sky that by the time you think about how are you going to implement this, the practitioner will look at you like you've got two heads and say, well,

that's all great and fun, but I can't really do that. So if you could talk a little bit about how you think your practitioner hat that you wore for so many years, how do you think that has influenced your ability to take a look at the R&D portfolio that you have now inherited at NIJ over the last several months?

Tracey Johnson [00:08:04] There are so many considerations when you're a bench scientist or you're managing a laboratory that has an established workflow or has an established LIMS system, has established protocols, you have concerns for how are you going to train your staff? How are you going to proficiency test your staff? How are you going to incorporate this into an already established workflow? Is this going to be a new method that just is lateral to what you're already doing, or is it going to be incorporated as the decision tree in your already established process? You know, when those are difficult things for sort of the researcher to think about, they just are investigating what they see as a challenge or a problem and are trying to find a solution. But how that solution fits into the to the greater scheme of what you're already doing is really difficult. You know, those are some of the challenges that as I was working at the biotech company, that we had to figure out and incorporate changes to funding availability so that we had developed a method to be able to do very high throughput testing for multiple modalities. So we would take every sample and we would test for STRs and Y-STRs. We kind of just had a really nice workflow to be able to do that so that we were generating results for all of the samples, for all of the modalities. Well, when funding changes and all of a sudden now we need to incorporate a third modality or we need to reduce to a single modality, you know, because of budgetary constraints for a period of time and then know that later on that we need to pick that other modality back up. How do you manage and track that information and then how do you prioritize training or prioritize all those sort of pieces? So, I mean, certainly, having the ability to sort of really understand that I think it's been, will be helpful.

Donia Slack [00:10:08] Are you seeing any particular trends now and in where our field is going and where research is taking us? We just recently, in a separate meeting you and I were in, were looking at the entirety of the forensic biology grants from the very first one to the ones that you guys just funded last year. And so it was interesting to see some of the trend lines of some of the methodologies and whatnot. So maybe do you have any thoughts on where the field is kind of going and some of the trends you're seeing in the grants?

Tracey Johnson [00:10:42] So body fluid ID has been a big area of research. And I think that this body of work has been going on for a number of years. And I kind of feel like it's at the point of being mature enough because there have been so many lines of investigation. There have been lines of investigation that are protein-based or mRNA-based or DNA-based. And I think at this point in time that research has, like I said, matured enough that we might be ready for implementation. So that's been an interesting body of work to sort of begin to understand. I would say prior to coming to NIJ that was not necessarily a body of work that I understood very well. Having been a practitioner that was primarily concerned with human identification, I haven't had the same type of experience as a forensic scientist that works in a law enforcement guided laboratory. So things like sexual assault processing, body fluid identification, have not really been part of my career path. And so beginning to understand those has been interesting. The other thing that I think it really is an interesting line of investigation and I haven't seen as many research in this area is sort of the identification or visualization of DNA prior to collection. I think, I mean, this would be a real game changer, I think, in the forensic community being able to assess exactly where to collect DNA and being able to know that you're going to be able to get a good sample. I mean, you've been able to do this with sort of some different lighting techniques before,

but they haven't necessarily been fairly robust in the way that some of the newer techniques using sort of dyes to be able to do this, I think are really interesting so that, you know, that you're collecting DNA, where exactly to collect, how much DNA might be there. And I think in combination with maybe some engineering for delivery would be very interesting so that you sort of have maybe a total package to be able to apply whatever dye or mechanism is necessary to visualize the DNA and then collect the DNA. Some substrates that I think are kind of difficult to do - obviously, field applications would be pretty difficult in terms of collecting samples from like doorframes or walls, things that are really difficult to move to a forensic laboratory, but also things like large items like bedsheets, clothing, or tape. I mean, tape is an awful substrate to collect DNA off of, if you've ever, you know, sort of tried to unwind those big balls of tape. Collecting fingerprints and DNA from something like that is very, very challenging and having a sort of mechanism to be able to zero in on where exactly you want to target your efforts. I think that's kind of a big game changer in an area that I'm looking forward to seeing more applications and evaluating those as they come through. And there's been an awful lot of work now in sort of advancing techniques, but I haven't seen as many on the sort of front end side of things. I just feel like there's still a lot of room for the collection, the extraction, the efficiency piece of things before you even get to the extracted DNA. There's a lot of work. I feel like that can still be done in that area. Always.

Donia Slack [00:14:22] Yeah, absolutely. It's definitely, it's one of those areas that would be perfect to begin in the research cycle here because there are so many questions of, you know, how much will it possibly dilute your sample and maybe degrade it. And maybe those are not concerns with certain dyes and chemicals, but some are. So yeah, no, I fully agree. Imagine being able to just walk into a crime scene and easily be able to say, yeah, this is where you handled this or that or you know. I know there are some other methods with alternate light sources and whatnot, but it doesn't cover all of them. Right? You might be able to find a semen stain easily. But clearly, finding even a sweaty palm, you might see some indications, but it's not so bright as it would be for other types of stain. So definitely. Before joining RTI, I was at Bode for 12 years in their research department and we did a lot of work of trying to detect front end like that with ninhydrin and whatnot. But imagine having to spray surface areas of a room or, you know, a non-porous area that makes it very challenging with ninhydrin. Now you have stains everywhere that if someone else comes behind you and touches that same doorknob now their hand is going to be stained purple for the next three days. So, yeah, no, I agree. That is a very interesting area to take research.

Tracey Johnson [00:15:42] Yeah. And I think it's, it's an opportunity where other sort of non forensic minded basic research has an opportunity to sort of come in and lend their expertise to the forensic communities or see a lot of intersection between maybe some engineering and development to honor those sort of front end piece of things. It's less the molecular biology and more about the dynamics and physics.

Donia Slack [00:16:11] Yeah, I completely agree. I think some of the more creative solutions that have come to pass as of late are ones that do involve like this multidisciplinary thought, right? Like rapid DNA is a really great example. Right. We could have never gotten to a lab in a box had engineers not come into play and said, hey, I can engineer stuff. And, you know what the molecular biology part of this should look like so let's come together and produce the solution. And then you've got the optics and the physics of all of that. So bringing so, yeah, I completely agree. Pulling together some of these other disciplines I think makes for some of the most interesting solutions for our field.

Tracey Johnson [00:16:51] I was going to say with the introduction of NGS technologies, just big data and bioinformatics and the software that's really, really necessary in order to make the most use of the data that's there. I mean, there's that's an intersection that, you know, five years I probably wouldn't have imagined.

Donia Slack [00:17:11] Yeah, it actually leads me to my next discussion topic is really about the big data and how we're looking at other markers. Just wondering for me, I have opinions but, you know, how do you think things like forensic genealogy and looking at now instead of just 20 markers now we're looking at five million markers when we're looking at SNPs for crime solving. Really, I mean, it's beyond even human identification, right? In my mind, there's a big shake up, right when it comes to some of this. And we leapfrogged, I think, in the last couple of years. So I'd love to hear your thoughts on some of the FGGs and how that even relates to some of the sequencing technologies that are now assisting with forensic genealogy as well.

Tracey Johnson [00:17:56] Yeah, we actually just had this conversation inside of OIFS the other day, you know, trying to help the other scientists really understand what IGG is all about and the disconnect between the databases that house that information. I mean, these are crowdsourced databases and they have in no way are connected to our forensic law enforcement databases like NDIS. So, again, you know, I feel like we're sort of at the opportunity stage where we have this capability exists. It's out there and there's a pretty significant push from the law enforcement community, post the Golden State killer case in 2018, to apply these techniques. But is it really the best application of the tools that we have available to us right now? And I think familial analysis and familial searching kind of gets overshadowed to some degree.

Donia Slack [00:18:49] Yes.

Tracey Johnson [00:18:49] Not all states allow familial searching, obviously, right now. So it's not available everywhere, but where it's available, that's a very good tool that can be used to identify a direct relative, a biological sibling, parent, child. And that's a much easier justification. It's a much easier opportunity to be able to pinpoint the individual of interest as it relates to sort of a cold case or an unidentified suspect. IGG obviously offers a similar opportunity to identify someone in a cold case, but the path to travel from there to the identification of, say, the Golden State killer is a pretty arduous and difficult one. Not that it's not worth doing. It absolutely is worth doing. But I think we sort of lack some of the oversights necessary right now to be able to do those in meaningful ways. Some of the language to understand what we're doing, I mean, as it is right now, being able to sequence STRs, we're just now sort of developing that language to understand the additional value inside of the STR. We don't quite yet have that. When I denote this is an 11* or an 11R or whatever that that language is going to be, that we all have that sort of common understanding as to what that means. There are those sorts of policy level and language repository databases, information that we need to be able to support these technologies. So I think things like the identification of the Golden State killer have been really, really, really fantastic. We, as sort of a forensic community, haven't quite caught up to all of the necessary quality assurance, quality control, language policy guidance recommendations that we need. I mean, we have right now, we have the DOJ interim policy in IGG and we have the SWGDAM, not even recommendations - we have a letter from SWGDAM kind of giving us some guidance and directions. But that's all that we have for IGG right now. We don't have a common set of markers that's available. We have vendors out there that are making this technology available and we have some laboratories that are adopting the technology. But there's a pretty big disparity in what

those two forensic vendors are providing in terms of the information that you can get out of those kits and then compared to the things that sort of direct to consumer DNA kits, the 23andme kits, provide. And so having more oversight or having better guidance to the broader community, I think is where we need to go.

Donia Slack [00:21:52] Yeah, I agree. You know, and especially in states where familial DNA searching is allowed, you know, making sure that all of the steps are followed in a logical way so that you don't have to put all your resources into a forensic genealogy solution where possibly something simpler, quicker, less expensive might have been fine. Right. And then making sure that it's done in a way where we all know that what goes to court is going to be the traditional STR profile, making sure that you have all your ducks in a row, that that is what you're going to be defending and that's what you're presenting in court so that you don't you're not sending your entire sample for only one shot of something where you've done your due diligence. So I agree. I think we definitely need the guidance. I was so happy to see the interim policy come out. Actually, at this point, it's -

Tracey Johnson [00:22:45] November of 2019. So-

Donia Slack [00:22:47] OK.

Both [00:22:49] Yeah.

Donia Slack [00:22:50] So I know that the more formalized policy I know that's still in the works at DOJ, so I know people are anxiously awaiting some of that language to be firmed up.

Tracey Johnson [00:23:01] Exactly. You know, and it's so important because it impacts not just the laboratory, it impacts the whole triad, right, of forensic science - the lawyers, the investigators, the forensic scientists, everybody is affected by these decisions to use some of these more advanced techniques. Again, very important, and resulted in the identification of the Golden State killer. For the sort of common or everyday sort of situation, there might be a much more straightforward or simpler way that isn't going to have such a profound impact on that whole triad or everybody from the prosecutor to the bench scientist to the investigator.

Donia Slack [00:23:43] Another thing I wanted to touch upon, you were talking about the research going forward with body fluid identification. The most recent R&D symposium that had to go virtual this year that always overlaps with the American Academy of Forensic Sciences meeting - I know Bruce McCord, he presented on epigenetic multiplex markers for body fluid identification. That one really stood out to me because it's one of those examples where we're looking at these alternative markers, right. We're kind of stepping outside of our comfort zone and looking at how other scientific disciplines not related to forensic science are applying different techniques or different markers to investigate a problem. Looking at epigenetics, I was wondering if you had thoughts. I know that epigenetics are a fantastic way to look at lots of different aspects of a sample that are nontraditional, obviously. So, you know, the portfolio looks like there might be more research in this realm for age determination or body fluid type or phenotype even, right? So any thoughts you have on where that's going?

Tracey Johnson [00:24:46] Again, this is a really fascinating area of research. It's a great body of work being done in this area. I'll just make some comparisons. So unlike NGS, which had some familiarity, I think with the typical forensic scientist, because it was a bio, it

was a molecular biology technique that was maybe familiar, sort of a PCR, especially to those of us at AFDIL that were already doing Sanger sequencing. It isn't that big of a stretch to sort of mentally leap from Sanger sequencing to next generation sequencing. Data analysis and the bioinformatics obviously is a big stretch. Things like epigenetics and proteomics, there isn't that same parallel with current techniques that are happening. And so I think it will sort of take some level of introduction of those types of not the technique, but sort of like the basic understanding of how that epigenetics applies to body fluid identification or applies to age determination. It will take some of that understanding to promote the adoption of these kinds of techniques. In addition, I think the development of a multiplexed assay that might look more like a kit format where you have instructions and you can execute on those instructions, makes it a little easier to implement. And, of course, understanding sort of that the basic science that goes into or behind how that assay works is necessary because you have to be able to explain it. You have to be able to understand how it works. You have to be able to problem solve. And when you have samples that don't exactly work the way you expect them to. That's why it's so important for those of us that are forensic scientists to understand things like PCR, things like extractions, the bind-wash-elute of most typical extraction chemistry nowadays, or even real time PCR and sort of concepts behind how those techniques work so that you can problem solve when things don't exactly go right. And so I think it will take better, broader understanding of some of these newer methodologies, epigenetics, proteomics and other kinds of things before we see the adoption. But I think exposure is really important. And speaking of the R&D symposium, it was virtual this year. And so because of that, we had a huge number of people that were able to attend and may not have been able to attend otherwise. And this is just fantastic. I really hope the ability to be able to continue to do virtual attendance at conferences continues, knowing, obviously, that attending an actual conference in person is preferrable in my mind, because you get to have this sort of like, you know, one on one conversations with scientists in what feels like a situation where you're not sort of being bothered by work, but the ability to be able to attend virtually a conference and just get the exposure is really, really key.

Donia Slack [00:28:02] I definitely agree with that because a lot of times there are so many people from around the country that are unable to attend for whatever reason. So having these virtual meetings, I thought this last one I thought was really great. And I actually presented a poster in the R&D portfolio section and I wasn't sure how that was going to go. I've never done a virtual poster before. I was able to record mine and in the five minutes and do the traditional poster layout. And then when I saw some of my colleagues doing some of the same and being able to look at their research in five-minute snippets, I was like, this is a great way to do this. And it was exciting, too, because the poster that I presented was on the decontamination of biological fluids from crime scene equipment. And I had that grant and worked in collaboration with Bode doing the DNA side of that, some of the analysis as well. And what was great about that is that within, I don't know, 48 hours of that poster going live, I was contacted by a practitioner and he said, hey, I saw your poster. This was great. Could you give me some specific recommendations? We're about to change some of our decontamination processes. Do you think this would be corrosive? And it was a really wonderful way to see that research was reaching people that might not have gone to the academy meeting or might not have gone in person to this meeting. They were able to see that. And it was even more fulfilling because it was a practitioner and they were literally about to look at some of their SOPs and were looking at research that the NIJ put out so that they can make some informed decisions. So I thought that was kind of like a really nice take home story of like, yep, these are successful meetings, virtually or not. But I do agree I cannot wait to be back in person. I do agree that one of the greatest benefits, especially from these meetings, is

when you can put the researchers in the same room as the practitioners and then by chance at some of these mixers, they'll meet up and you'll just hear the practitioner say, well, we've got this problem set. And then the researcher is like, well, wait a second, we might have a solution.

Tracey Johnson [00:30:12] Absolutely. Absolutely. But just the exposure and being able to deliver the information and to get people sort of, you know, out of their every day I need to maintain this piece of equipment and I need to finish this case and I need to do a review on this and I need to do all of these things, but just have that moment to get them outside of those worlds and get them into these sort of moments where they can think creatively and sort of look at problem sets from a from a very different perspective, I think is really important. One of the things that I enjoyed the most as a young forensic scientist were these opportunities to do this. I didn't necessarily always get a chance to apply them or test them or try them, but they were really motivating and sustaining for me. And I think that that's key.

Donia Slack [00:31:04] Agreed. I've now been with the FTCoE for about five years, and I must say it's been one of the more rewarding parts of my career. I have truly enjoyed being able to support the NIJ, especially when it comes to a lot of the transition of grants and helping practitioners implement research. Right. Because I've come from the research realm. I would love to hear your thoughts now coming in as one of the NIJ's newer physical scientists of your thoughts on some of the transition support through the FTCoE to NIJ.

Tracey Johnson [00:31:35] So I think that's been one of the more rewarding aspects over the last four months that I've spent here at NIJ is sort of understanding how we interface together, the NIJ and the FTCoE and then how we interface with the researchers and the investigators that are applying to our grant opportunities. The NIJ has somewhat limited budget. We have a somewhat limited bandwidth and we have a somewhat limited capability just because of resources. We have a particular niche area in which we're looking to expand our efforts. And I see the FTCoE as kind of that long arm of the NIJ and being able to expend resources to spend time with the investigators. And that's really the critical piece of it, to spend time with those investigators, to get them to understand what's necessary, to get their technology or to get their research into a forensic laboratory. More often than not, they're not an actual practitioner. And so they don't necessarily understand the needs of the laboratory or the readiness levels that the laboratory needs before they're ready to adopt that technology. And we don't necessarily have the resources to be able to do that, but FTCoE does. To look at the broader portfolio of the research that's happening and being funded by the NIJ, but then to narrow in on a particular researcher's technology, to be able to help them mature that to help them work with partners, commercial partners, or to work with their university's technology transition department to help ready that to socialize, to package that research in a way that is consumable by those of us in the forensic science community at the bench. So I think that that's been a really fantastic and rewarding element that I wasn't necessarily expecting when I started here at NIJ.

Donia Slack [00:33:43] You know, one of the things that not everybody realizes about the FTCoE is that we are here to help with that transition. Right. That is one of the biggest parts of the goal of the FTCoE is to make sure that researchers are supported and practitioners can tap into the research in a practical way to be able to implement new technologies and novel ways to solve problems that they're having for laboratory considerations or beyond. And so it's definitely been rewarding to be able to help with some of those tech transition workshops and seeing people learn a different skill and actually apply it. One of my favorite stories is one of the tech transition workshops that we

hosted a couple of years for you guys on death investigation. A couple of months later, one of the investigators came back and said, thank you so much for hosting that workshop. I actually was able to apply everything that I learned and it helped solve a case. When you think about it like that is really the goal, right? It's why we all came into this field as we wanted to make that broader impact, as you had spoken about before. And so when we can see that even something as small as maybe changing a laboratory process, that makes something more efficient or something more sensitive, where you might not have been able to investigate the biological sample in a way that actually could have led to a case resolution. It's exciting to be a part of. So. -.

Tracey Johnson [00:35:12] Yeah, and I go back to exposure. I think exposure is so key. I mean, if you're not introduced to the concept or introduced to the idea that this is capa- this is available or capable of doing something in a different way than you have been exposed to before having a workshop. I know I'm looking forward to an opportunity for us to do an NGS workshop.

Donia Slack [00:35:35] Yes.

Tracey Johnson [00:35:35] You know, a hands-on workshop that'll be really meaningful. Obviously, that won't happen for a little bit. But that is so key and important to put that technology in someone's hands, even if it is just sort of in a learning opportunity for them to see, like, this is not overwhelming. This is not scary. This is very doable. And here are some tools to help you through that process.

Donia Slack [00:36:02] Could not agree more. With that, Tracey, it has been a pleasure speaking with you today. I thank you so much for taking the time to discuss your thoughts.

Tracey Johnson [00:36:12] You're welcome.

Donia Slack [00:36:13] And thank you to our listeners for tuning in.

Voiceover [00:36:19] This episode concludes our 2021 NIJ R&D and Beyond mini season. Be sure to check back regularly and keep an ear out for our upcoming summer season, where we will be discussing current topics in sexual assault response reform. Opinions or points of views expressed in this podcast represent a consensus of the authors and do not necessarily represent the official position or policies of its funding.