Just Enhancing Research to Improve Tech Transition.wav

Introduction [00:00:01] RTI International's Justice Practice area presents Just Science.

Introduction [00:00:09] 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 three of our Roadmap to Improving Technology Transition season Just Science sat down with Doctor Catherine Grgicak, Associate Professor of Chemistry at Rutgers University, Camden, and Henry Maynard, Lead Research Scientist for the United States Army Criminal Investigation Laboratory, to discuss the importance of developing research infrastructure within forensic laboratories and communication channels with collaborators. Forensic research and advancement are impossible without the input of forensic practitioners. However, many practitioners are not accustomed to engaging in formal academic research. As a result, the National Institute of Justice's Forensic Laboratory Needs Technology Working Group, or FLN TWG, has identified important tools for building an infrastructure for research and collaboration with forensic laboratories. Listen along as doctor Grgicak and Henry describe how research is ingrained in forensic practice, how to empower new forensic scientists to get excited about research and resources to better integrate forensic researchers and practitioners. This episode is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Some content in this podcast may be considered sensitive and may evoke emotional responses, or may not be appropriate for younger audiences. Here's your host, Rebecca Shute.

Rebecca Shute [00:01:28] Hello and welcome to Just Science. I'm your host, Rebecca Shute, with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. On today's episode, we will discuss the value of research, infrastructure and communication to drive technology transition within the forensic community. This discussion builds on a recent Forensic Laboratory Needs Technology Working Group effort to develop a roadmap to improve research and technology transition in forensic science. Here to guide us in this discussion is Doctor Catherine Grgicak, Associate Professor of Chemistry at Rutgers University, Camden, and Henry Maynard, Lead Research Scientist for the United States Army Criminal Investigation Laboratory. Welcome, Catherine and Henry.

Catherine Grgicak [00:02:07] Nice to be here, Rebecca.

Henry Maynard [00:02:09] Hi Rebecca, thanks for having us.

Rebecca Shute [00:02:10] Great to have you both today. As you know, the FLN TWG Research subcommittee worked hard on a report that explored ways to promote technology transition and some of the main barriers that were identified involved communication, coordination and knowledge about the specific research needs which form the basis for good partnerships. Why is communication and alignment between researchers and practitioners important, and what's the role and impact of good feedback loops?

Henry Maynard [00:02:32] I think it's a great question. You know, when we explore the research process, starting with a research need, leading to a research project, and then a validation and implementation within a single laboratory, and then hopefully later on with proper information sharing, adoption, implementation at many labs. Strong communication and clear expectations are absolutely paramount. If you think about it, you know, in the

research process, if one party is not aligned with the other, it can lead to a complete stop. So if a lab has a research need and there's nobody there to support the research project, the idea is dead on arrival. Or if a lab shares its research need with the university and a researcher completes the research project, but the lab doesn't implement or validate the method, for example, the idea stops there as well. When we think about research translating into commercial products and new technologies, there's even more parties within the research innovation ecosystem. So with the more parties and partnerships, strong communications, clear expectations and alignment is really the fuel to make this research idea or research need go forward.

Catherine Grgicak [00:03:28] I think alignment is the key.

Rebecca Shute [00:03:30] Catherine, as an academic researcher, could you explain the challenges associated with finding a forensic lab to collaborate with?

Catherine Grgicak [00:03:37] I think there are a number of challenges along the way, and the first is when one is first beginning a project, you have to find partners that are interested in that project full stop. So once that occurs, there might be a number of laboratories who are interested in engaging with you on that project. Or they might approach you with a project, but nonetheless, you get together and there might be a large number of laboratories and even academic institutions that get involved. And one of the challenges, I think, for maintaining the life of any project is just to make sure that there's alignment in both expectations of the projects and the deliverables and what questions we're trying to answer, but also with the time commitment. And so oftentimes if we're working with a very enthusiastic partner, whether it be another researcher or operational laboratory interested in implementing a new technology, if they don't have the time or the bandwidth or upper administration commitment to that project, then sometimes that can be a challenge. One of the things we could do as a team, if one's working on a project, if it's multidisciplinary, multi-institutional, is treat it like it's going to be a long run project and really try to get a sense of what questions we're trying to answer and at what point should we answer them. And how, of course, can we most efficiently break up the work so that as a team, we can answer the questions as efficiently as possible? So if you take sort of a project management approach to the larger program, then it does seem to work, at least for me, a little bit more cohesively. But really, yeah, it turns out to be, the bandwidth issue. You know, a lot of labs are at capacity because they have case work responsibilities. And then similarly, the researchers are at capacity because they have their educational responsibilities. And so really, to complete the research project, one wants to always make sure that we have an understanding of everybody's capacity and interest level. It's as I said before, it's like any good relationship. You just need proper communication channels between the parties and some flexibility.

Henry Maynard [00:06:01] Yeah, I think that's a really good point. You know, you've talked about the importance of formal project management. Especially having that at the university and at the lab side, universities routinely have grants and cooperative agreements and so running projects is something they're particularly skill that they know project management. And, you know, when you have research scientists at the laboratory, they're really good at formal project management as well. And one of the key elements of project management is communication. It's interesting when you talk about the communication channels in projects. And so if you had a a small project inside of a lab, you might be working with, you know, 2 or 3 or 4 people. If you have a partnership that goes beyond that with university, you're increasing your number of communication channels. And with project management, there's actually a formula about the number of

communication channels and how it grows based on the number of people engaged. So, you know, if you have two people in a project, it's A to B communication. So there's one channel, but with four people it's A to B, A to C , A to D, B to C, B to D and C to D. And so effectively there's six communication channels and as you go up it gets even more and more and more. So when we talk about trying to translate technology or translate a research project into, you know, market adoption, all the forensic science labs using it, think about how many people are engaged. And these numbers just get really big, really fast. So when you have 100 people that's engaged in moving a technology forward, that could be more than 4950 communication channels. So you can see communication truly is paramount in project management skills. The plan, the communication, the role assignment, the expectations in all parties is really important as well.

Rebecca Shute [00:07:43] So what resources are available to help academic organizations align with forensic laboratory needs and foster collaborations todat? And for the remaining gaps how might academic organizations overcome these challenges and make connections?

Catherine Grgicak [00:07:56] Well, for me, I think the conference is a great place to start. It's a traditional form of starting communication, the networking, aspect of it. Go to a conference, you present what you've done thus far. And again, that's that's a form of communication from one person presenting to potentially hundreds of people. And I always felt that that was a really great place to start, because when you're communicating with newly interested parties, so sometimes the person in the audience, they'll just be learning about your research project, because even though you might have published on it, really, it's that verbal communication that seems to hit with a lot of people. So that's a wonderful place to start. But there's also online resources available too. So I've made use of the ASCLD LEAP program. So that is the Laboratory Educators Alliance Program. And so in that program, what they've been able to do is set up, a website where researchers can describe their project, and then you describe the project and say, hey, you know, I have this project and I'd like to partner with interested laboratories. And then the laboratories would contact you. And then the reverse can also happen. So I think that's a really great way of reaching those individuals or those laboratories who maybe weren't at the conference you were at. So, those are two mechanisms by which you can hit a broad audience and similarly publications. So if you publish something and just keep a really open mind in the sense that if the narrative of the publication is open, then it's possible that you'll get a hit. That is, someone will ask you, hey, what did you mean by this figure? Or why did you conclude this? And that can start a conversation as well. And the other, I guess, more modern or technologically relevant ways of doing it is simply through YouTube videos, right? Just for any form of communication expressing to individuals what your vision is and what the project is. Oftentimes there's an overlap between what it is that you're doing as a researcher and what it is that the laboratories either want to do, i.e. they recognize the gap, and so they can connect with you and say, oh, hey, I think what you're doing is applicable to us, although maybe we wouldn't have done it in this way. And I think just forming that again, that alliance, that communications channel at the front end of a project, that is when the project is really early on in development, it's invaluable. The other thing too, also is from a research perspective, there's the OSAC research needs, for example. So there's a lot of online resources where the anyone interested in developing a new project to fill a current gap. One of the things they really need to understand is the discipline of forensic science. So we want to, as researchers, have a better sense of where the gaps lie and how deep they go. And so that will allow anyone who's trying to solve a grand challenge by developing new technology or acquiring new foundational knowledge. You know, you can't acquire that unless you have a very good sense of, you know, what

traditional forms of technology look like. So even just the lists of gaps or research needs from the various organizations are an invaluable resource.

Henry Maynard [00:11:44] I really like what Catherine said. It highlighted all the main sources of information sharing and highlights the importance of information sharing, whether it's at a conference, whether you're responding to somebody's article, whether using ASCLD LEAP, or even starting off by identifying research needs of the community from either NIJ or OSAC or ASCLD and using those to form and create a partnership. All those are ways that we can bridge the gap between labs and universities.

Rebecca Shute [00:12:10] I think that also emphasizes the importance of conveners and enablers, like some community members, that we talk about a lot in the roadmap as the ability to sort of be that that binder, that catalyst between researchers and practitioners there. The fintech subcommittee noted that alignment between researchers and practitioners falls short without research infrastructure that equips forensic laboratories as well as their partners, to effectively transition research. The subcommittee identified the need for specifically research scientists at forensic science service providers that could help bridge the gap between the case working forensic world and academic researchers. Henry, can you explain how having a dedicated research scientist would benefit a forensic science laboratory?

Henry Maynard [00:12:52] Sure. It's a great question. Catherine hit on this earlier. She talked about how a examiner has a lot of responsibilities and duties already. So trying to to have even more, you know, take care of research and partnerships, establishing processes around research. That can be a lot. So if a laboratory invests and having research scientist, you're making investment in creating expertise with very specific skills. So the research scientist generally will have skills in research, project design, project planning, conducting research, formal project management, communication facilitation, stakeholder analysis and even how to form partnerships. So I think there's a lot of benefit to the specialization of labor. In that way we gain efficiencies in the system. Interestingly enough, last month the 2020 BJS census of Publicly Funded Forensic Crime Laboratory report was published, and there are some interesting stats within that document. 33% of all the crime labs with 100 or more full time equivalent employees had resources dedicated primarily to research. And if we think about this, this makes sense. You know, as technology advances and new technologies enter the commercial space, this is going to lead to new evidence types and probably even new crimes, new scenarios. So the forensic capabilities to test and evaluate this evidence will also need to adapt and advance for the labs with 100 or more full time equivalent employees, 91% receive federal grants, whereas labs that actually had fewer people have a much lower percentage of the labs receiving federal grants. So, for example, for labs that have nine or fewer people, only 56 receive federal grants. You know, this might hint at that if there's dedicated resources, you know, dedicated research scientist, they're also able to help establish laboratory needs internally, conduct the research partner with universities, and even write research proposals to help address the laboratory needs, which can actually pay for themselves.

Rebecca Shute [00:14:49] So how would having a dedicated research scientist support collaboration between labs and universities?

Henry Maynard [00:14:55] I think by having a dedicated research scientist first, you know, from from a systems thinking perspective, I think having an individual support processes at the laboratory will gain efficiencies. So you can have a research scientist that's responsible for creating a process for capturing all the research needs at a laboratory, right. So if we

can tap into the intellectual capability of every single person at the laboratory, we can get a whole bunch of ideas that could be the future of the field. So having somebody dedicated to that process, to, pulling the ideas and seeing them take shape and move forward. Right. So once we have these ideas, it could lead to research projects that are either done internally with the lab's resources, or they could actually look at partnership mechanisms with universities. So if we did have a dedicated POC, a dedicated research scientist that knows, again, formal project management, communication, research, design, all these things, we can make more effective collaborations between labs and universities. And to Catherine's earlier point, the more we can define the problem set that we're trying to fix with research, the more beneficial it is through that partnership, because now we can identify who's going to do what and in how to support that project.

Catherine Grgicak [00:16:09] Having a technical point of contact at both institutions is going to be invaluable. So there's always going to be administrative support and there's going to be science support, you know, in the form of the scientists doing the work and or and or students that are actually engaged in the work, but especially for larger projects, it does behoove the team to have a named technical point of contact for each institution associated with that project. And the reason for that, I found personally, is that you just if there's ever an issue or a problem that has to be overcome, a challenge that has to be overcome, then you know exactly who to go to. So again, it comes back to those communication channels. To have that technical point of contact I think is is really key. If there's an individual who has a lot of experience being a technical point of contact, that of course helps both the university and the FSSP in their communications.

Rebecca Shute [00:17:12] Catherine, from your perspective, how else might the research scientist role in forensic laboratories provide value to academic researchers?

Catherine Grgicak [00:17:19] I can see a number of ways. As Henry mentioned already, they can help the academic researcher understand the laboratories gaps, whether it's technical gaps or gaps in knowledge that is, the challenges they know are present and want to overcome. If there's a technical point of contact that you know has experience with reading not just forensic literature, but broad literature, broad scientific literature, it's possible that they'll be able to contact an individual at a university because they would know, for example, that this university has this piece of equipment that maybe the lab doesn't have right now. So a really simple example, of course, is the one I just pointed to, which is equipment. So if the laboratories researcher is really interested in delving into something that their lab doesn't have capability in-house to do, they could reach out and say, hey, is it possible for us to do a test at your core facility, the research scientist, because they have specified bandwidth to focus on knowing what academic departments have on offer, then just that in and of itself would help. As well as helping researchers at academic units understand the forensic discipline and the gaps associated with their current methods. And so I think the other thing, too, is, I mean, forensic science is, to me, a discipline. There is a goal. The goal is to understand what happened at the crime scene rather than just to build new technology ad hoc, you know, maybe for another application and then apply it to forensics, you know, later on in the process and thinking, oh, well, this might work for forensics. Really, if if forensics as a discipline is put at the forefront of research, where the entire domain is interested in not only developing new technology, but implementing these new thoughts, these new ideas, these new designs, I think what that would do is expand the research enterprise within the forensic science discipline. And that, to me, is the most exciting part of this roadmap, is this aspirational notion that the forensic science research enterprise can be had and can be had if we accept and have an

understanding that forensic science is not just some some application of a science that already exists, but it is in itself its own discipline deserving of research efforts.

Henry Maynard [00:20:16] I like what Catherine just said. When we, you know, forensic science research is applied research, right? There is a defined purpose. We're trying to advance our forensic science capabilities to support society. So the more we can standardize, process or create systems within systems, the faster the evolutions can go of technology, bring technologies online, which means more feedback loops for researchers and technology developers. Now, if this industry if this enterprise is moving fast and it's very clear how to enter in, how to participate, how fast it moves, more small businesses are going to come in, more, commercial partners are going to come in. And now it becomes this very innovative community where everyone can create, new technologies and we have a great testbed. We have all the universities, we have all the labs, we have all the industry partners together working collaboratively at advancing it. And I think that's what really, I don't know, at least my hope for the big picture goals of the roadmap is showing each person in the forensic science, research and innovation ecosystem that they have an important role and that we're actually all in this together and we all can make great strides if we work together in that way.

Rebecca Shute [00:21:28] I think the innovation ecosystem part is a great thing to bring up. We wanted to, you know, in the roadmap, provide awareness that indeed it as an ecosystem and that there's a ton of potential to to be tap there. You know, when we think about enabling a culture of research, it also includes empowering the next generation of forensic scientists. What might this look like in the academic sphere, and what can forensic leadership practitioners or even research scientists do to enable this?

Catherine Grgicak [00:21:56] Getting the future of future forensic scientists ready for their professional life I think it takes it's a multi-step process. But again, there's the same theme of understanding that the student, the future forensic practitioner, will be a multi-component professional, so they have to understand the basic science, of course, that's acquired through classroom endeavors. But then beyond that, the new forensic scientists, they could engage most certainly in research questions. And they do that for a number of reasons. One is because it's beneficial to their own training, right? They gain skills. They learn how to pipette, they learn how to think about projects, learn a little bit of technical knowledge, Excel graph building. You know, and if they write it, they put it all together into a single deliverable. Then the hope is, of course, that they'll be able to understand where their project lies within a larger ecosystem. That whole experience, I think, allows the student to develop their mindset to not only be an analyst, because of course, they're developing the skills while they're doing that. But then we hope at least become aware of all of the different challenges that are faced by the domain, you know, at large. And so I am a huge supporter and proponent of students engaging in research, especially during their senior and graduate years. I think it's an invaluable experience for them. Of course, FEPAC agrees since it's in their standards as well, and it's something that I am committed to. I think a student could gain a lot from. And so really it just depends on where their interests lie. You can envision a student performing a research project and on the research committee as both their professor and research scientist at an FSSP. I mean, just the amount of guidance that that student will acquire from having those two mentors available to them, I think is invaluable. And so, as we're developing the new forensic scientists, I definitely think not only coursework, but valuing the research experience is an important aspect of building that that new scientist.

Henry Maynard [00:24:31] Yeah. When I think about the next generation and the work that's being done in academic institutions now, it's it's really important they're prepping the next generation workforce. And I think early engagement with forensic science laboratories to understand what the what the mission is, how work's being performed is definitely one of the key things. We know that as new technology comes on board, as new products enter the market space, you know, deepfakes, AI, autonomous vehicles, it's going to bring new challenges. And I think the academic community really can help out in developing the next generation by by focusing on some core skills that the students are going to need to come out of forensic science programs. And I think it's the four C's creative thinking, critical thinking, communication and collaboration. These four skills, these four core skills are going to help students come out of the forensic science program, and be able to tackle some of the challenges. There's not an SOP on how to do an evaluation of this brand new piece of technology that nobody's ever seen for the first time. So you're going to have to think about it creatively, like, what can I do with this information? You're going to think of it critically analyze. Okay. Is this, repeatable? Is this a reliable piece of information? How do you communicate the results and how to collaborate with people? Because if you think about it, forensics is really expanding. We're getting more and more to big data. Were gonna need data scientists were to need a lot more computer science support along the way as too as digital evidence domain expands further and further. I think those are four the key skills that universities can help develop in the future generation, the next workforce for forensics.

Catherine Grgicak [00:26:05] So from a practical perspective, what could forensic scientist practitioners do to help the new emerging forensic scientists who will end up in their laboratories again, contact those universities, just volunteer to be on their research committees. So it's a little bit different. It depends on the school. But usually every program who student engages in research, they have some sort of end deliverable the student needs to provide. Typically, they'll require a committee of knowledgeable, experienced individuals to guide them. Then being the student to guide them through their project. I think it's safe to say quite a few welcome a practitioner input, because what it does is it provides not only the student with a networking opportunity and, you know, they learn how how the laboratory works. Generally speaking, if they've never worked in a laboratory themselves, they have no idea there from a process perspective or from an evidentiary evaluation perspective. Right? They have perceptions based on what they've gathered from the media, but they wouldn't know the day to day. So connecting with an individual who works in the laboratory through their professors so that both the academic needs and the operational needs, so the FSSP needs are met, so that you're helping mentor a new scientist so that they're welcome into the domain, I think is just invaluable for both the students and the professors. I most certainly would say, if you're interested in research lines, you want to get more involved, be on a committee.

Henry Maynard [00:27:52] When there is, you know, a dedicated person at the lab, you know, a research scientist at the laboratory that's dedicated to being a POC for the university. It ties into so many benefits as that person is working closely with the university more and more, they're learning more about the different faculty there. And so they're effectively creating a pretty big network. You know, who can I call that has expertise? And you always have somebody that's willing to help. So these dedicated research scientist making partnerships with universities and even the interns that are supporting research projects that are also taking part of the information sharing process and the collaborative process of research we're learning more about, you know, bridging the gaps in between learning more about who's doing what and the skill sets and the expertise that exist. So it's it's really beneficial.

Catherine Grgicak [00:28:42] Speaking of feedback loops, too, because these future practitioners, they would also be future research interested practitioners. Right. And then there would be this positive feedback loop associated with technology development and of course translation, which is one of the key components of the document that we wrote. One of the things that we wanted to focus on is this notion of not only how do we build a healthy research culture within the forensic science discipline, but how do we do so efficiently? And of course, the students are a key component to that. Academicians are key component. FSSPs and the people who work at FSSPs are key component. But so are industry partners and even investigators, because sometimes, you know, it's the investigators that come up with questions that are really compelling and oftentimes very challenging to answer. But it's the challenging questions that sometimes result in in the best, most interesting solutions.

Henry Maynard [00:29:46] So that's a good point, right? Challenging problems oftentimes require even interdisciplinary solutions. Research that crosses industry domains, disciplines, even, foundations of knowledge. We have to tap into different experts to be able to solve that problem now and in the future.

Rebecca Shute [00:30:03] Bringing back the innovation ecosystem piece. The many players in this academic leadership is also really important as well. And I think it's important to note that forensic science research may take a less traditional pathway than what academic leadership sees happening in several different industries, and as a result, researchers might find it difficult to participate in forensic technology research. Catherine, how should academic leadership shift their perspective when considering the value of forensic science research?

Catherine Grgicak [00:30:31] I think that's a great question, and I think perception is exactly the right word. It's simply a perception that forensic science, you know, doesn't engage in in research let's say. I think that's demonstrably untrue. And and I find that if the narrative is structured in such a way where academic administrators believe that, oh, it's a it should be a professional program or it's, you know, it should be class based rather than research based or they, you know, the students don't really, you know, we don't have to invest in the research infrastructure for the forensics program because there are going to be practitioners. It's that's not necessarily true. And so I oftentimes try to explain to those around me that even if the title of a new hire is practitioner right, DNA analyst, let's say or forensic chemist. They invariably will be doing some sort of research, whether they have to validate a new technology or they have to understand a new technology that was implemented. And so they have to know how to read the scientific literature so that they have a clear and foundational understanding of why that technology was adopted in the first place. So I think with the academic leadership, that's the only thing that needs to be expressed, is that forensics is awash in research. We just don't title it that. But we do it all the time and it's high time it's necessary, I think now, that when when we do discuss research relationships and when we're engaging, academic administration and trying to, let's say, convince them that partnering with this operational laboratory is worthwhile, I think it's just a matter of saying, look, we have a grand challenge that needs to be addressed. We think that we have a solution to this grand challenge. And just because the Grand Challenge happens to be a forensically relevant question, it doesn't change the fact that it is still a grand challenge. I mean, ultimately, big research projects endeavor to solve a grand challenge, either through, again, acquisition of new foundational knowledge so that people can engineer, like practical solutions or by engineering the practical solutions themselves. So yeah, I think it is simply a perception. I think we need to start with the

perception that we're a non research domain. There's this notion I think, which is a good thing that's been gaining approval, which is that we as a discipline most certainly should be sharing data amongst not only our ourselves, but with other disciplines like the data scientists, the biologists, the geneticists. It's a theme, right? Communication, openness, broadening our understanding of what forensic science is, what it encapsulates, thinking about it as a domain or an enterprise or an ecosystem, rather than as a discipline.

Henry Maynard [00:34:06] You know? Yeah, I agree, research is something that people are basically doing in forensics all the time. Everything is an evaluation, everything is an analysis. We're constantly looking at something, evaluating it, questioning it, trying to understand more about it. And I think sometimes research can be intimidating, like if you if you're working with students or even interns, at times research can sound big and intimidating and, you know, statistics and all these big projects. But the more we actually work together, you know, labs, universities, industry partners, and the more codified those partnerships, relationships and systems are, the more you're going to have interactions with so many different people. And you're gonna realize that everyone is not an expert in everything. And it means you don't have to be an expert in everything. It means it's okay not to know everything. You know, you're bringing your component of knowledge to the table so you can collaborate as a group. And I think that takes, you know, big R research off the the pillar and it makes it more accessible. It allows everyone to participate and contribute in a meaningful way. In my experience, I think one of the things I really appreciate about academic leadership is when they're prioritizing and valuing partnerships with forensic science labs. Sometimes there's a lot of, you know, just like forensic science examiners, there's a lot of pressure on folks. Sometimes in academics, academic culture, it's the same. It's, you know, write grants, you know, try to bring in funds to support the university, to provide opportunities for students, for academic leadership that values the partnerships of the forensic science labs and makes that a priority. I think that's something that's, very desirable and very honorable to do in the research innovation ecosystem. You know, oftentimes we we look at different people's, motives or participating for different reasons, like why why they're there. I, I've worked with a lot of industry partners, too, where I've had conversations with industry partners where, you know, it never is about profit. You know, I had a good friend of mine who works for a company, he told me is all I'm trying to ever do is help the problems that exist. That's my role as industry. So one of the the fun things about research and having these networks and participating in this ecosystem is seeing all the different players and the parties and experiencing the diversity of thought and experience. And seeing everyone work together collaboratively. And from my vantage point, people are really doing that. So the more you get involved in research, the more you get to see that and the more fun it really becomes. You really get to see all of this community work together to advance the field of forensic science.

Rebecca Shute [00:36:42] Thinking for more of the academic research side. How should researchers use this road map?

Catherine Grgicak [00:36:46] I think they should use it as guidance, and I think if they read it with an open mind and as an aspirational document, and then they can and should ask themselves, what information can I take from this document and apply to my own research programs? I think there is a lot of information in that roadmap. Also, ways in which we envisioned the different stakeholders working together. Find out if when you read the roadmap, if you agree, but also where you might fit within that ecosystem, and then to put it into practice is just as, you know, just a simple question of what step can I take as a researcher to move the domain forward? As we've been mentioning before. One of the things that science does is it tries to answer grand challenges. And forensics is awash with

grand challenges. It's a very challenging field with extremely challenging questions. And the questions are so challenging that the solutions that we come up with for ourselves might one day be applied to other domains. That would be phenomenal. And so I've seen that occur. And I think if forensic science, as you know, again, as a discipline, is understood to be one that engages in research, I think that would be a phenomenal result. And I think that is what the roadmap also suggests.

Henry Maynard [00:38:32] You know, I think that the roadmap really, you know, we take it back from the top. It's the call to action. How do we improve technology transition in forensic science? And through the FLN TWG research subcommittee, we explored not just the one Valley of Death, but the two the two value deaths. Sometimes research doesn't, you know, get implemented in a lab, and sometimes it doesn't go across and get translated across other labs. And so the roadmap was produced to provide visibility and awareness of tools and solutions that can help each individual within the research ecosystem where they are at, what tools are available to them, and how they can partner in the next level. It really shares ideas and awareness of different resources available to them, and also paints the picture of what the future could look like if there is more standardization of process and systems building. If we build these systems such that they're they're interwoven in a way we can see a lot more of our technology or, a lot more of our research, move forward into operations, into new technologies, and make sure that we have the best forensic science capabilities to support our customers.

Catherine Grgicak [00:39:46] In the forensic field when one especially if you're building an technology or new framework, always having in your mind translation. What will translation of this thing right this research project look like? The one piece of advice I give myself, anyway, that I gathered from working on with the FLN TWG team on this roadmap is engage the operational laboratories early during conception, during design of experiments, during the time where you think you might be synthesizing something because to weight to a point where you've already developed the prototype, I think is a lost opportunity. And so when when one is engaging with the operational labs, again, we talked about bandwidth issues. Go ahead and reassure them. Really what I'm looking for is more mentorship, you know, more advice from you like on what what you care about, you know, whether or not this technology would be relevant to you, whether or not it would be relevant to your lab and if not to your lab specifically, would it be relevant to the domain? If I were to pick out one thing or two things, I think there's for me, there's the theme of communication and collaboration and agency between units, interdisciplinary and multi-institutional agency, but also get communicating. Early rather than later on.

Henry Maynard [00:41:26] You bring up a good point about, you know, problem solving. And we always talk about, you know, having really good research needs, processes. And what I always like to say is how to resolve the edge of the question. And it reminds me of this great law that we talk about Giblin's Law, which says, if you write the problem down clearly, then the matter is half solved. So it speaks to, with early engagement, early participation between universities and research scientist and, forensic scientist at the laboratory we're able to resolve the edge of the question so we can work on the exact problem set that we need to address. And there's great efficiencies gained.

Rebecca Shute [00:42:07] Henry and Catherine, thank you so much for your time discussing your experiences. It really has been a pleasure talking with you today.

Catherine Grgicak [00:42:14] Thanks so much, Rebecca.

Henry Maynard [00:42:15] Thanks, Rebecca and Catherine. Great conversation. Really appreciate the opportunity.

Rebecca Shute [00:42:20] If you enjoyed today's episode, be sure to like and follow Just Science on your platform of choice. For more information on today's topic in the FLN TWG Roadmap, visit forensicCOE.org. I'm Rebecca Shute, and this has been another episode of Just Science.

Introduction [00:42:37] Next week, just sits down with doctor Catherine Grgicak and Stephanie Stoiloff to discuss what we can learn from successes and failures in technology transition. Opinions are 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.