

Just Diversity & Inclusion in Forensic Science

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

Voiceover [00:00:19] 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 this special release episode, Just Science sat down with Donia Slack, the Director of Research, Technology, and Evaluation Program in RTI's Center for Forensic Sciences, and Dale Hart, a Research Forensic Scientist in RTI's Center for Forensic Sciences, to discuss the importance of diversity and inclusion in forensics. Forensics is a fast-growing field making the need for racial and gender representation among its practitioners critically important. From confronting biased research to experiencing microaggressions and feelings of "imposter syndrome," our expert panelists know the realities of being underrepresented in the field. Listen along as they detail their experiences as forensic scientists of color, articulate how bias and underrepresentation can produce flawed findings, and discuss the impact that diversity and inclusion has had in their careers in this episode of Just Science. This episode is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Here's your host, Dr. Lawrance Mullen.

Lawrance Mullen [00:01:27] Hello and welcome to Just Science. I'm your host, Dr. Lawrance Mullen with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. Our topic today is the importance of diversity and inclusion in the forensic sciences. To help us with the conversation, I'm joined by two forensic scientists. First, we have Donia Slack. Welcome, Donia.

Donia Slack [00:01:46] Hi, thanks for having me.

Lawrance Mullen [00:01:47] Next, we have Dale Hart. Welcome, Dale.

Dale Hart [00:01:50] Hello, and I'm glad to be here.

Lawrance Mullen [00:01:51] Again, we want this conversation to be completely organic. This is a safe space, and we basically just want to talk over diversity in forensic sciences and what that actually means. So there are many fields that lack racial and gender representation, and the same goes for forensics. So our first question - can either of you, or both preferably, tell us a little bit about your career path in forensics? Donia first.

Donia Slack [00:02:16] So I ended up in forensics, I would say, almost unplanned. So about 17, 18 years ago or so, I was in a graduate program at Catholic University in Washington, D.C. My dissertation work actually was revolving around cancer cells and apoptosis - basically how cells die when they are confronted with chemotherapy drugs. And I will say that my experience at grad school was definitely an interesting one where, you know, I was not expecting to leave with a master's degree - I was in the Ph.D. program. I will say that one of the reasons why I left probably did have something to do with some challenges that I experienced that I could probably attribute to my- both my gender and my ethnic background. And I am a Latin woman. I am Dominican. I did leave graduate school a little bit unexpectedly. There were some frustrations at the very end there, and I decided quickly that instead of dealing with a lot of the stressors that I was dealing with at that time, I was able to get special permission from the dean to be able to leave with my master's instead of the Ph.D. But long story short, I was able to look for

alternate careers with a master's degree in cell biology at Bode Technology, and it was in their research department for forensic DNA. I thought, well, that's pretty interesting. I don't know anything about forensics. I've never thought about the use of DNA technologies or DNA research to be able to apply that to forensics. Spent 13 years at Bode, and I was able to work my way up from a just a bench research forensic scientist to the vice president of their research and development program there. Six years ago, I found a position for RTI International where I would be helping to work on the Forensic Technology Center of Excellence, and I have been here ever since.

Lawrance Mullen [00:04:07] Dale, would you like to enlighten us with your journey?

Dale Hart [00:04:11] Like Donia, I kind of got into forensics by accident, too. I went to Davidson College as an undergraduate. I was a chemistry major, and as I went through my program, I got more interested in chemistry and wanted to do something in the chemistry field. When I was a junior, I think, in my program, I had an opportunity to go to a forensic chemistry lab, actually. And I was interested in it and asked- I remember asking some of the chemists in the lab, well, how do you get to do this? You know, and this was back in the late 70s. There weren't a lot of programs in forensic chemistry. In fact, there were probably none. The way folks learned forensic chemistry was by working in a crime lab, which was the way a lot of forensic sciences were done, you know, 40-some years ago. I didn't really think too much about it after then - went back, went into my senior year, finished up, and graduated. Now one thing that I had going with me at the same time was I went through college on a three-year Army ROTC scholarship. You're actually commissioned as a second lieutenant like the day before you graduate. But I had requested deferment to go to graduate school, and I went to the University of Georgia in the chemistry department and entered their Ph.D. program - the straight through Ph.D. where I wouldn't get a masters. And what happened with me was I went through that program, my major professor didn't get tenure and left. So that kind of left me high and dry. I was really far along in my program. So I asked the army for more time. They said no, and they said, here are your orders for your first assignment. It just happened my first assignment was at the Armed Forces Institute of Pathology in the Forensic Toxicology Laboratory, which now is actually part of the Armed Forces Medical Examiner System, AFMES. But that's where I started, and I stayed there for about 10 months and then I got new orders, and my new orders were to go across the street to Walter Reed's Clinical Chemistry Lab and be the manager of the clinical chemistry lab. So I was all prepared and I was meeting with the lab manager there and really trying to get the lay of the land. About a week before I was going to that laboratory, the director for the Fort Meade Drug Testing Laboratory, which was about 30 miles away, came over and said, we've asked that you be- instead of going to the clinical chemistry lab, since you've worked in forensics for a year and know something about chain of custody and all of that, we're going to grab you and send you to the drug testing lab. And I stayed there the remaining three years of my army career before leaving and then going to a commercial drug testing laboratory, and then eventually to RTI. I've been at RTI since 1995. Lawrance and I are in the same department here - the Laboratory Quality Assurance group. My career has been in quality assurance and quality control and reference materials.

Lawrance Mullen [00:07:10] Wow - such a rich tapestry of just history. I mean, my story is somewhat similar, not really knowing about forensic sciences. Graduating from undergrad, I had a just a standard bachelor's in chemistry degree at Dillard University, which is an HBCU. I actually wanted to be a pharmacist for a little bit. I didn't want to take the PCATs, so I was like, OK, I'mma just take a little break from the PCAT and the break was to go get a masters. I got waitlisted by Tulane and so I said, OK, my next option was a school in

Dayton, Ohio. It's called Wright State University, and that program was actually a little bit different from Tulane's in the fact that it had pharmacology and toxicology. At Wright State I was like, man, I'm going to be making drugs. That's totally what I'm going to be doing. When I got involved in the program, the toxicological side probably spoke more to me than the pharmacological, so like the development - making drugs. Got finished with the program - it was a very long and intensive program. From there, I ended up getting a job in Charlotte working at a pain management laboratory, and I had no idea what that was, either. They asked me what I knew about drugs and things of that nature, and prior to that I had been teaching. So I was an academician for all this time, and I just had been working in academics, teaching pharmacology, teaching pathophysiology and anatomy and physiology. About five years ago, I ended up seeing a job at RTI, and I've been here ever since. I think that kind of gives us a perfect segue way into the meat of what it is that we're talking about today. So how has diversity and inclusion played a part in your occupation?

Dale Hart [00:08:45] The way I'm going to go with this question is going to be is how has like an emphasis on diversity affected me overall, really. I'm the old guy in here, you know, 63 - grew up during the Civil Rights Movement. I was six years old when the Civil Rights Act passed and seven years old when the Voting Rights Act passed, and my schools were integrated when I was in the eighth grade - so that was in like 1973 or something like that. As I was getting towards my college career, one of the things that was happening - especially growing up in the South, I mean, I grew up in Greensboro, North Carolina, and Charlotte - there was a lot of outreach to students of color, in particular African-American students at that time, because a lot of schools in the South had been historically segregated and had remained that way really until probably the 60s. Been a pretty good student in high school, had good scores, good grades, all of that so I had all these schools reaching out. I ended up landing at Davidson. It was close to Charlotte. I knew it, it had a good academic reputation, so I decided to go there. But you know, coming up in that what I'd call affirmative action era, where they were really trying to get students of color to integrate the schools, that was one case in which that outreach for diversity actually affected me in a positive way. When I went into the army and went to AFIP, I stepped to a very diverse workplace. My first boss, the lab director at the toxicology laboratory, was an African American. He was a full colonel in the Army with a Ph.D. in pharmacology and toxicology. He was the same age as my dad, actually. And this was a man who went to the army in 1957 and, you know, the armed services integrated in the early 1950s. So he was really coming into the army in that- at that time frame and a lot of the opportunities that he had was based on that, too - was based on that trying to improve diversity and to integrate the military. Unfortunately, I didn't get to spend a lot of time with him. He was six months from retiring. There were also in the laboratory at AFIP, being in the Washington, DC area, it was- had a very diverse staff. The military members were mostly laboratory technologist or lab technicians. They usually would have worked in clinical labs, but there were also civilian chemists who worked in the lab. And I remember the most senior civilian chemist who worked on the bench there was an African American woman. So, you know, being in the D.C. area, that's just an area that just by default, almost, you're going to have a diverse work environment. So all of that impacted me very positively. Also, when I got to Fort Meade, very diverse environment, lots of people of color as the supervisors in the sections of the labs. And I would get that again from being in the D.C. area where you have a very diverse pool of employees. And all of that, I think, was really the result of the years that the military had spent in working with diversity, but also, I remember we had intentional diversity training when I was in the army. Since I was an officer, probably being in the military would have been somewhat of a unique environment. You know, it's said that the United States Armed Forces is one of the most diverse workforces in the country. And that

was definitely true. And I think it's because of that long history that now goes back almost 70 years.

Lawrance Mullen [00:12:07] Donia, how about you?

Donia Slack [00:12:08] In my experience, I would say, at least in the forensic DNA realm, or I think forensics in general, research has shown, I think there was a recent one in [FSI Synergy Barbaro 2019](#)¹, where she states that the majority of forensic professionals are actually made up of women. It's actually pretty women heavy. But what's interesting, though, is if you look at underrepresented minorities across the STEM fields, even though, you know, blacks and Hispanics make up anywhere between 13 and 17 percent of the population of the United States, we only make up about five to six percent of the STEM workforce, right. So, I would say that in my experience, it was very common for me to be one of very many females in the discipline, but probably one of the few Latinx individuals in the room. I don't typically run into a lot of Latinx individuals in forensics, and you know, it's one of those things where you try not to make a big thing out of it, but you do sometimes notice the fact that you'll go to a professional conference and you're, you know, one of very few, at least in the Latinx space. On the other side, I'm really lucky to have a ton of female role models and representation on the female side. I have a lot of coworkers and friends, and I think it's great that, you know, as a female population, we are kind of in full force in forensics. But it's kind of a double-edged sword because what you will find is that a lot of the females in the field, they tend to be the ones where, you know, we are at the bachelor's and the master's level and not so much at Ph.D. levels. I guess it's an interesting workforce population when you see a lot of times, and it's still the case, where a lot of the leadership roles are filled by male representation as opposed to female. And I think it's changing. I do. I mean, I think the fact that if you look at forensic science programs across the board, most of the students are females. And you know, there- we are having a lot more representation from underrepresented minorities being interested in the field. So in my experience, I think that diversity and inclusion has played a part in my occupation because I feel like being part of that female tribe of making an impact in a STEM field. But on the other side, you know, it would be nice to see more representation across multiple ethnicities. What would that look like to have a different mindset, right? And that's really why diversity and inclusion is important, right? Like, everyone comes with a different life experience. Forensics is very mission driven, right. We are all kind of called to bettering the standardization of science for the application of public safety or criminal justice purposes, and so being able to look at it through the lens of your own upbringing.

Lawrance Mullen [00:14:59] I would definitely have to agree. I feel as though, you know, as far as diversity and inclusion in my current occupation, as well as just like throughout my careers, I feel as though it has played a very significant part. I think I'm probably more on, maybe more on trend with Donia's experience, I think. A sense of there's always a high representation of females, sometimes like females of color. There's often not as many men of color where I'm standing from it. Luckily, working here at RTI and working in the group, the LQA Group, I think we are actually a little bit different in the sense of diversity because our particular program is extremely diverse. But one of the other things that really resonated with me is the fact that oftentimes the leadership is not as diversified as it could be or- and/or as it should be. And I feel as though, although there may be a lot of people that may be working within the field, ultimately the people that make the decisions don't always look like us. And I think that that's one of the things that we need to face head on is trying to figure out how we can aid and assist in that change to see more people of color in

¹ Barbaro, A. (2019). Women in Forensics: An international overview. *Forensic Science International: Synergy*, 1, 137-139.

leadership roles because those are the people that kind of ultimately get to make those decisions that will impact and elicit the change that we want to see. This kind of like touches on something that Dale and I were talking about as it relates to research. Thing about research is a lot of times that we have the opportunity to sway research as it's important to us. Like with hair color bias - that particular area is something that may be foreign to some people if they're not doing hair research. But as a person of color, if I know that my hair color could potentially be more prone to accumulating and holding and retaining drugs as opposed to someone with lighter hair color, that's probably going to be something that's more relevant to me because I'm going to be more on trend with that to say, wow, you know, that could potentially be something that could affect someone that looks more like me. I think that having more diverse personnel as it relates to research will be more beneficial in the long term as it relates to funding research. Dale, do you have something else that you would like to add for that one?

Dale Hart [00:17:08] Yeah, that was kind of getting into, you know, the benefit of having diverse viewpoints when you're dealing in forensics. You know, we tend to think of science as largely being blind and neutral and to a large extent, that's true. But there are certain areas of science where there may be biases. They may be unintended but based on differences in physical characteristics of people. And when I talk with Lawrence about this and I looked at it, one of the areas of drug testing that is on the forefront, so to speak, is hair drug testing. One of the issues that has swirled around hair drug testing, probably for the last 30 years, has been whether there is a bias in hair color and how drugs are accumulated - how they're held onto by the hair. There's a theory, at least based on and then been supported by some research that darker hair tends to retain drugs better. The thought is it's due to melanin. There have been studies that have supported that and studies that did not. But the question itself is one that's important because what that leads to often is people implying that hair testing may be racially biased. Although it's based on hair color, not race, most people of color have dark hair, so- so it's gonna- as a proxy, it would be- become that. But even so, even if it was just based on hair color, hair color is an immutable characteristic. You know, whatever hair color you got, that's what you got. It's not going to change. And if there is something about your physical characteristics that could bias a test, you would want to know about that and research it. As an African American, I'm concerned about that not just for African-Americans, but for other people who might, by their good luck, have dark hair, and it may affect them differently. So, you know, there's been a fair amount of research in that area. I don't think it's been as concentrated as it could be, but it's a question that would have to be answered because in the criminal justice system, there are many biases built into the system that have evolved over a couple of hundred years. And to me, that you would not want to add another brick to that structure that biases things, especially where it hurts or does not benefit people of color. So my viewpoint on that is going to be very different, somebody who doesn't think about it, and that's where that input from life experience and everything else is going to play a part in how people view even research. The chemistry work that we do in the laboratory really is not biased. I mean, chemistry is chemistry - the tests that we do work equally well regardless of sample. But if there's something different about the samples you're analyzing, that can potentially have a negative impact on some people. So that's- that's a view I'm going to take, you know, and say, I want to know more about this.

Donia Slack [00:19:53] That's interesting that you say that, Dale. It reminds me too of, you know, in a different field why representation or why a different background will actually influence where you even want to take research. As an example, Dr. Ann Ross with NC State - so she's a Latina from Panama - and she has been in the field for a couple of decades as an anthropologist doing casework for North Carolina. And what's interesting is

because of her background and because of her passion for being able to name the unidentified, especially the migrant population around the borders and whatnot and internationally as well, you know, she has now been on the forefront of this discussion of like, how are human remains coded? You know, you can have a driver's license that's found on a body and- or it says that it's- it's a black male, but that's only because, you know, maybe 50 years ago or whatever, that person just identified as a black male because of skin color as opposed to anthropologically - there is no true construct of race when it comes to human skeletal remains. So looking at race as a construct as opposed to, you know, these defining things that we box in these biases and whatnot. You know, she's looking to start the discussion on, is there such a thing to put that, you know, as a forensic identifier? Do we call it population affinity instead? Her coming to the table with that viewpoint, that just goes to show with your story and examples like Dr. Ross that coming to the field with a different perspective can only benefit the field.

Lawrance Mullen [00:21:27] One hundred percent agree. Kind of shifting gears a little bit here - are there any stories you would like to share of the time you directly saw the benefit of diversity or inclusion in forensics?

Donia Slack [00:21:41] The story I can think of, I think that really impacted me and I've mentioned before that, you know, females do make up a good percentage of the forensic discipline, but not so much on the leadership roles. And I think what's really important is like when you can think of those times where you can automatically find an example of someone that you could model yourself after and that even without being an official mentor or even having conversations with that person, they impact your own career in a way that you can only look back on and say, oh yeah, that- that impacted me. One defining moment that I can remember is, I remember going, I don't know, 15 years ago or so I went to a- the Global Identity Summit. It's more military and DOD-based and how biometrics and forensics actually impact some of the more fighter and Department of Defense applications. I remember watching a woman go up on stage, Dr. Joan Bienvenue, and she went up on stage to give a presentation on rapid DNA. She was working for Lockheed Martin at the time, which, you know, obviously that's pretty impressive in itself. And I remember watching, she was confident, she was in a leadership position, and she was a female, and she was pregnant. And so I remember seeing all of these things and thinking to myself 15 years ago, wow, like that's really impressive. She is getting all this respect in this room. She definitely has the confidence, and she has the expertise. People are coming to her as an expert and there is nothing being held against her as being a female, being pregnant because these are things sometimes that we put on ourselves, right? Sometimes we think to ourselves as a female, you know, am I going to be looked down upon if I'm pregnant at a conference? Are they going to, you know, automatically discount me because of that, and to see her own that stage and be able to have that scientific presence that way, I felt that that was actually a defining moment. That idea of seeing representation matters and seeing yourself in people actually does matter because research has even shown, there was a study done in [2013 by Rutgers University](#)² where the fact that female students were in classes being taught by female professors actually positively impacted their desire to want to stay in the field, right. So and it's as simple as just seeing yourself in someone else. I think that alone is a really important aspect of D&I, right? We have to see ourselves to know that it's possible to be that. And so to that end, because I always think of that, I try to give back where I can. So when I have college students and they're interested in forensics or high school students and they're interested

² Young, D. M., Rudman, L. A., Buettner, H. M., & McLean, M. C. (2013). The influence of female role models on women's implicit science cognitions. *Psychology of Women Quarterly*, 37(3), 283-292.

in forensics, I'll make the time to do a quick zoom with them or meet with them and say, yeah, this is how I got here and this is possible and because I want them to see themselves in me. So one day they can look back and say, well, I remember seeing a Hispanic female that was in a pretty good position at RTI. Why can't I attain something like that one day too?

Lawrance Mullen [00:24:42] Something that Donia said about representation resonates with me, and I think that attending an HBCU, although like that's not directly forensic sciences, I had a lot of professors that looked like me. I went to a smaller school - during that time, like a lot of my professors were people of color - men, women - and they genuinely cared about my success. And I think that's what resonates the most. And I think that's basically been able to provide me with a foundation for success as it relates to any field. That's one of those things that you get from going to like a smaller school, especially an HBCU, because I felt like these are people that believe in me. They want to see me succeed - that kind of thing, and I think that it helped me to hold myself accountable for my own success, and I think that's just something that has stayed with me throughout my career. This next question is kind of like just one that we don't have to dwell on too long, but this question is microaggressions. I would like to kind of give a brief definition of microaggressions. So a microaggression is basically the indirect or subtle discrimination that people who are in marginalized groups often face. Have either of you ever experienced any microaggressions in the field of forensic sciences?

Donia Slack [00:25:56] I definitely have. I was in a Ph.D. program and did decide to leave with a master's degree. You know, some of the microaggressions I can remember even there and where I knew I had to, for my own mental health and sanity, just kind of leave that situation. And, you know, we put this on ourselves, too, where it's like, well, I've put out to do something. Of course I can do it. I'm in this program, I should finish it. But you know, a lot of times there's enough is enough - you have to cry uncle. And that was definitely one of those instances in my life, and it's all worked out for the better. I'm super happy with how my career ended up. But even some of the microaggressions there, I mean, I remember, you know, once being told by a professor - it was a public presentation that we had to do - I thought I did pretty well. I was getting really good feedback from the students and I got the grade back and it was a B. Went to him and said why did I get a B? I thought it went really well. He's like, I think you need to know your place. Comments like that where you're just like, I don't- don't know exactly what to do with that information. I don't know if, is it because I'm young? Is it because I'm a female? It's because I'm brown. I'm not sure what place I was supposed to have. And you know, there's things like that that have happened. I remember once I was in a meeting, I was questioning someone else's science and I wasn't being disrespectful. I was just, you know, honestly having a discussion about the statistics of Hardy Weinberg, actually. And it was, you know, an older gentleman that was presenting on this and I was questioning it - at the break, he came up to me and I swear he was close to patting my head and he looked at me and said, oh, aren't you a little smart one? And again, I don't know what to do with that information. Sometimes it happens, and it's one of those things where those times in your life, you start questioning yourself and you start putting this feeling of this imposter syndrome, right? And I know that that's been in literature, of like, do I belong here? I feel like I don't. Am I just an imposter in this room? And it's really hard to tell young people that that's crazy, right? Like because you feel what you feel - once you hit your 30s and 40s and Dale, I'm sure you're feeling it in your 50s and 60s you would have experienced where you start telling yourself like, nope, there is no imposter syndrome here. You know, I am brought to the table for a reason. I do have an expertise and it's one thing to question it and have a healthy scientific debate, but it's another thing to be condescending or belittle. There hits point in one's own

personal growth that you end up owning your confidence and saying, no, I'm not going to take abusive or toxicity, but I will take a healthy debate, but let's do it in a respectful manner.

Dale Hart [00:28:29] And my view on this again, because of my age would be different because I come from the age of macroaggressions. You know, at the time when things were pretty brutal, especially when I was a young, a young kid and going through that. You either don't notice as much or you dismiss them more quickly, I think. So I didn't experience a lot in the forensic field or in my jobs, not much that I can think about. I've always felt like I was pretty well respected by peers and even bosses. I probably experienced the most in my undergraduate college career, and that was just the experience of going to, you know, a southern college that had recently integrated that formerly had been an all-male school. So, you know, you're going to get that. But I really didn't experience, I didn't really experience what I call a lot of microaggressions in, you know, as I got into my career.

Donia Slack [00:29:19] I do wonder, I mean, our experiences do seem to differ greatly, Dale, with some of those types of things. And the one thing I mentioned before, it's like, sometimes I can't place, is it because I'm, you know, young, brown or female? The things that we have in common from our experiences is that we're both underrepresented minorities, black and Hispanic. But the one thing that is different is our gender. So it is interesting. Maybe the question is being somewhat answered. Maybe the microaggressions that I might have experienced might be because of my gender and not necessarily - I don't know. It's just interesting that we have these, these different perspectives. But I do think that maybe you might have hit the nail on the head that if you grew up in a time of macroaggressions, microaggressions - that just rolls off your back, you don't notice them. So that's a really interesting perspective, Dale.

Dale Hart [00:30:08] Yeah, I think you build up a bit of armor because of that. And when you've got that armor, the smaller things that - I noticed them at times. I've not noticed them a lot in my career - I noticed them more in just my day-to-day life. They tend to roll off of you a little bit more than- than other things because yeah, my early life there were a lot of negative things. I mean, things that kids should not be exposed to. So that makes a difference. I've seen the progress and I've seen more diversity in a lot of fields and in technical fields. And that's a plus. Again, it's still not where it should be, but I think there are a lot of reasons for that. I think a lot of that stuff is set in motion when you're a child, I mean, I got my first chemistry set when I was 10 years old, so.

Donia Slack [00:30:51] What about you, Lawrance? Do you feel like you've experienced it? There is a definite age gap between you and Dale.

Lawrance Mullen [00:30:57] I think I probably have. I think in comparison to Dale, I'm in my like mid-thirties. Most of my microaggressions probably relate back to grad school, more so because, like I said before I went to HBCU, so I didn't experience very many there that could be attributed to a lack of diversity and/or inclusion or equity. But I think when I went to grad school, I did really experience a lot of them. So for my graduate cohort, it was 10 of us and then there was only two people of color. And so it was just an odd time, like it was an odd experience. I don't know if it's more of an unconscious bias or whatever - one comment the program director made, and she was like, you always dress so well. And I was like, well, well, thanks. You know, I'm young, 20-something. I'm like, yeah, man. And then she followed up with, it must be because you're black, and I just kind of smiled and nod- nodded with that. But what am I supposed to do with that? Here I am, you know, 15

years later, and that's still something that resonates within me. That wasn't right. She probably shouldn't have said that. And then another example was where the students were holding a potluck. And so everybody was talking about what they were going to bring. One guy was like he was going to bring chili. I mean, it's the Midwest. Everybody is going to probably want to bring chili. And so I didn't really know what I wanted to bring. And she was like, well, you could bring some fried chicken. And I mean, who doesn't like fried chicken? I mean, fried chicken is a universal treat, but it's not something that I present. And so for those of you that know me directly, that's not something that it even looks like I eat because I don't eat fried chicken that often. But I do like fried chicken and I can actually fry some really good chicken. But that was definitely something that was inappropriate for her to say. But again, it was one of those things in which I just kind of smiled and nodded and just kind of said, no, I don't think I'll bring that. But as I grow and learn more about myself and about the world as we all do, you know, I realized that those are things that are issues and those are things that I don't want upcoming generations to have to deal with and that we should always be conscious of, you know, things that could potentially hurt anyone, whether it be based on, you know, gender, creed or religion, whatever it may be - we have to be conscious of those things, especially in work environments. So how do you all think that we can kind of build the steam? What would you tell up-and-coming forensic scientists about the importance of diversity inclusion in forensics?

Donia Slack [00:33:23] The last BJS crime census analysis that went out was in 2014, and it predicted that there was going to be a 27 percent growth in open positions across the forensic sciences between 2014 and 2024. So we're coming across the end of that and so a) telling them that there are positions in this field, right? That's definitely something I think that the younger generation should know. But one of the things I think that is most important is I think that over the last at least almost two decades of my own career, I've definitely seen an increase in the representation. So I would say, look to those role models, look to those professors that do look like you and, you know, don't feel embarrassed to ask what was your journey? A lot of times all you have to hear is that there was a journey, and it's not always straightforward. And I think the three of our stories actually demonstrate exactly that. It's not like we b-lined it for where we are right now. Like, there are sometimes this circuitous way to get to where you are, and it's very rare to just, you know, set your mind to be something and it- that's exactly what you're going to be. There's going to be adversity a little bit. You might experience some microaggressions. You will feel imposter syndrome. That's going to happen. You know, there will be different challenges that you're going to face in school. There's going to be challenges you're going to face as an early career person and there's going to be challenges as a late career person. These things exist. It happens. You know, I would also say ask for the feedback and ask for it to be, you know, honest feedback. There's nothing wrong with just saying, hey, you're great at this, but here's where you could use some improvement. So I would say try to be constructive with criticism because these things shape people.

Dale Hart [00:35:05] You know, I'd encourage students in the sciences to look at the forensic field. The difficulty sometimes is in STEM fields, you have several paths that people can go. One of them is academics, of course - research and teaching. Another would be commercial or industry. Industry tends to pay a lot, and that tends to attract a lot of people. When you get into forensic labs, especially when you're in something like tox or forensic chemistry where you're doing analytical chemistry, often you may have much better salary outlooks if you go into industry simply because they've got deeper pockets. And that's something that draws out of the leaky pipeline in STEM - one of the things that's a leak, it does leak, get people out of STEM, but they tend to follow where the money is

going. You know, you have to persuade them that working in the forensic field is can be challenging and rewarding. You know, that they're needed in those fields.

Donia Slack [00:35:59] Actually, that's interesting, Dale. There was actually a paper in [2011 by Etzkowitz and Ranga](#)³ that they said exactly that - that it's not necessarily a leaky pipeline, but instead they called it a vanishing box where these new occupations that do this technology, where the STEM fields kind of overlap in that industry realm, where that's where a lot of females are being drawn into that. I don't know if they did an analysis on the underrepresented minorities, but it's interesting to think of like, well, where are they leaking through? And is this really a vanishing box? And maybe that's positive too, because representation on the nexus of industry and science is just as important as research.

Lawrance Mullen [00:36:37] I think it does kind of boil down to just trying to figure out how to get people excited about it. When I was in undergrad, I had absolutely no idea what forensics was besides seeing something on CSI. Even now, with trying to explain to people what it is that I actually do, and no, it's not CSI. It is not things flown in the sky with us touching it, and it's moving across the screen. It's urine, it's blood, it's sweat, and it's- it's frustrating at times. I mean, you know, I just was able to get back into the lab and do some research. And you know, once you've been out of the lab for a little bit, it's a little bit difficult. It's kind of like riding a bike, but it's like you keep falling down, you know. It can be difficult, and I think that addressing that and again, putting it into perspective, what it is that we're doing as a whole would be something that could resonate with people. We're all researchers, all scientists here. And so what are some actionable steps that we can take to ensure more representation in forensic sciences?

Dale Hart [00:37:36] That trip to the crime lab when I was a junior in college, did, you know, kind of spark my interest in forensic lab. I think that if there was more outreach to especially young college students, you know, as they're entering their programs from folks in the field, you know, this is what we do. This is how interesting it is because a lot of times you're solving puzzles in a sense and then why it's important - you know, how it connects to issues of health and, you know, criminal justice and all of that. So, you know, if you get people, people when they're entering their programs, you can start them at least thinking about it. And then, you know, beyond that, just some intentional other outreach - you know, participating in job fairs and things like that at colleges - that would draw people into the fields some. But I think the earlier, the better, really.

Donia Slack [00:38:22] I completely agree with that, Dale. I really do. One of the things that really I think influences is just being able to see representation of yourself in the job. And there was a study done by [Barr, Gonzalez, and Wanat in 2008](#)⁴, where they did a pre- and post- test of incoming freshmen at Stanford University that were pre-med. And then they surveyed them at the end of their sophomore year to see had they stayed with the pre-med program, so a STEM field. And the underrepresented minorities had actually lost interest, and even to a greater extent, the females. And so one of the primary questions that they asked was, you know, why? So two answers really came forth - was one, that they didn't feel that they had a lot of guidance from their guidance counselors. So the academic advising arena and in my mind I'm thinking, is that representation maybe? Is that- is that as something as simple as if they had had an academic advisor or a guidance

³ Etzkowitz, H., & Ranga, M. (2011). Gender dynamics in science and technology: From the "leaky pipeline" to the "vanish box". *Brussels economic review*, 54(2/3), 131-147.

⁴ Barr, D. A., Gonzalez, M. E., & Wanat, S. F. (2008). The leaky pipeline: Factors associated with early decline in interest in premedical studies among underrepresented minority undergraduate students. *Academic Medicine*, 83(5), 503-511.

counselor in their early career that looked more like them that would say, I look like you. We have similar experiences, you know, stick with it. You know, this is the benefits to that. Maybe that would have been a different story. And oddly enough, chemistry. And I know Lawrance, you made the joke earlier about like, how, you know, chemistry classes, you know, that's- that's usually where people get weeded out once you hit organic chemistry. And that is no lie - to me as a biologist, I found chemistry to be a challenge. Obviously, I passed all of my chemistry classes - I wouldn't be here if I couldn't, but you know, I did find it to be a challenge. And so I think that it's really important to give back to the community and like meet with people when they want to talk to you about the field of forensics. I'm part of a business alliance for my son's high school, and they were looking for someone who was in forensics that might be able to answer questions. And a female that said, you know, I'm really interested, but I'm really bad at chemistry. And I said, no, no, it's OK to not be good at chemistry. You can still pass and not be amazing at chemistry - now maybe you don't want to go into, you know, controlled substances or toxicology, you know, but if all you're looking for is to get through the program and do something else in that same forensics field that's maybe not chemistry, just know that you can do it with tutoring. You can do it with, you know, group sessions. Meet with the teachers. If it takes you more than once to pass the class, that's OK. The journey through how you get through the sciences can be hard. You know, sometimes it's really important sometimes to see some of your role models and know that they were not 4.0 undergraduate students, right? So I tell people this all the time. I was not a 4.0 student in undergrad. I'd like to tell people that so that they know that it's- you don't have to be the 4.0 student and still be a success later on in life. So I think sharing our experiences, being honest about the journey, telling them that there's going to be struggles and then just representing, I think that goes a long way.

Lawrance Mullen [00:41:08] I think well said and I would agree completely. And I think that that's really imperative. People do get hung up on that, like especially with the chemistry, almost like the illusion that sometimes that chemists or people in forensic sciences, that- that role that we play, people think everybody is geniuses. And that kind of feeds further into that imposter syndrome aspect because you get into a room and it's all these brilliant people and you're just kind of sitting there like, well, well do I know what they're talking about? And it's just making sure that you're confident in what it is that you're saying. I mean, I was not a 4.0 student. I definitely, I think I made a C in organic. Like I think it was broken up into two parts - I think I made a C and an A. So I mean, I think that that's really vital to like put on a little bit more humanistic display in saying that, you know, hey, it's tough, but it's not as tough for you not to be able to accomplish it and letting them know that it can be financially stable as well. Because at the end of the day, money does play a significant role in the way that we select our careers. And it's something that you can really be proud of. And I really like the thing that Dale said about the puzzle piece, because a lot of it is putting everything together and trying to figure out how does this go together? And I think everything that we do basically impacts humanity in a sense, like, you know, I think that's a really good principle of our mission statement or part of it at RTI, like, you know, in trying to improve the human condition. And that's like a really good tagline. I don't know who came up with that, but that is like a wonderful tagline to have into a logo like who doesn't want to improve the human condition?

Donia Slack [00:42:42] I love it, too. I love it, too. It really resonates with me as well.

Lawrance Mullen [00:42:47] It's such a good tagline. I don't know who came up with that, but I hope that they definitely got a raise or a promotion or whatever it was. But I feel as though like those are key things that we can do to enhance the forensic science world. And then again, just being that representation for people of color. I really have enjoyed this

time just sitting and talking and just really getting to know both of you more - it was definitely invaluable as well.

Donia Slack [00:43:10] Thank you, Lawrance, for having me.

Dale Hart [00:43:12] It was great to be on with y'all.

Lawrance Mullen [00:43:13] So again, if you've enjoyed today's conversation, be sure to like and follow Just Science on your podcast platform of choice. For more information on today's topic and resources in the forensic field, visit ForensicCOE.org. I'm Dr. Lawrance Mullen, and this has been another episode of Just Science.

Voiceover [00:43:33] Next season, Just Science covers firearms related topics and applied justice research. 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.