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ISHI INTERNATIONAL SYMPOSIUM ON HUMAN IDENTIFICATION

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February 2022

The ISHI Report

News from the World of DNA Forensics

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The ISHI Report

Letter from the Editor

Greetings from Madison, Wisconsin.

Though it's hard to imagine a Spring thaw just yet, the ISHI team is already thinking ahead to the end of October when we'll again gather for our annual conference. This year's meeting will be held at the Gaylord National Harbor, just outside of Washington D.C. To accommodate those unable to travel, we will once again offer the option to participate virtually. Taking into account feedback from previous attendees, we'll be live streaming the General Session presentations, allowing those attending virtually to watch and ask questions in real time. Select workshops will be available to watch on-demand after they are originally presented. Registration is now open for both attendees and exhibitors, and we invite you to visit our website, www.ishinews.com to learn more and reserve your spot. You can read more about workshop offerings on page 11 of this magazine.

We have expanded the ISHI team by six members as we've formed an inaugural advisory committee. We will be conferring with the committee throughout the planning of the conference and are grateful for the expertise and experience that they bring. We introduce those who make up the committee on page 4.

The ISHI team is also excited to announce a new partnership with *Forensic Genomics* as the official journal of the conference. *Forensic Genomics* is a new peer-reviewed journal that addresses how advances in genetic testing and genomic analysis can enable investigators to break through previously impenetrable forensic DNA barriers. Led by Editor-in-Chief David Mittelman, PhD, Founder & Chief Executive Officer, Othram, Inc., the journal focuses on the use of DNA testing technologies, algorithms, artificial intelligence, and genealogical research methods to support human identification using inference tools and inductive reasoning. *Forensic Genomics* aims to accelerate the validation and adoption of new methods to support investigations that would be otherwise stalled with traditional testing methods (view past issues). **You can receive a discounted subscription rate to the journal by using code "ISHI". Learn more and start your subscription here.**

In this issue of the ISHI Report, Ken Doyle examines the concepts of race, ethnicity, and ancestry and what they mean in forensics. Guest authors in this issue include Dr. Claire Glynn, from the University of New Haven, who created and coordinates the university's online Graduate Certificate in Forensic Genetic Genealogy. In her article, she details why the program was created, course offerings, and benefits to interested students. Workshop chair, Tiffany Roy, provides some guidance on testifying in court based on Evett et al's hierarchy of propositions.

Our colleague Ann MacPhetridge had the pleasure to interview last year's student ambassadors who are pursuing excellence and blazing a trail in the forensic DNA space. Words cannot express how excited we are to see what they accomplish in their careers. We are currently looking for our next group of ISHI student ambassadors and encourage you to check out page 12 to learn more. If you know of a student who you think might make an ideal Student Ambassador, please share details with them and encourage them to apply! Speaking of forensic DNA students, did you know that we have a page on our website dedicated to student resources? For those looking for new career or internship opportunities or those looking to fill these positions, we've also created a job listings page.

Finally, for those interested in learning more about forensic genetic genealogy, we invite you to check out our upcoming webinar series in April. This series will cover FGG caveats and best practices, dispelling common myths, how to evaluate a case before working with a genealogist and how to work with a genetic genealogical data analysts and other external partners. Presenters will also discuss technologies surrounding FGG, such as targeted sequencing, WGS, and SNP arrays and what kind of questions you can expect when FGG cases go to court. Presenters include Steve Busch, Steve Kramer, Rachel Oefelein, and Danny Hellwig. Learn more on page 6.

We hope you enjoy the February issue. As always, we welcome your ideas and written contributions to our publication.

Stay well,

The Editorial Board

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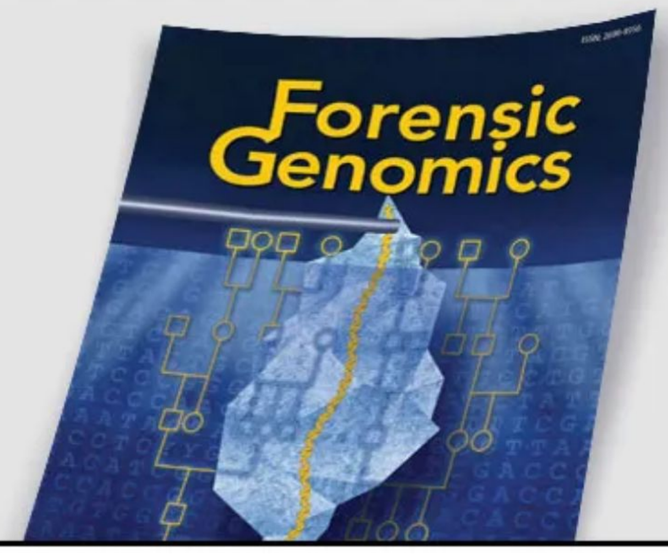

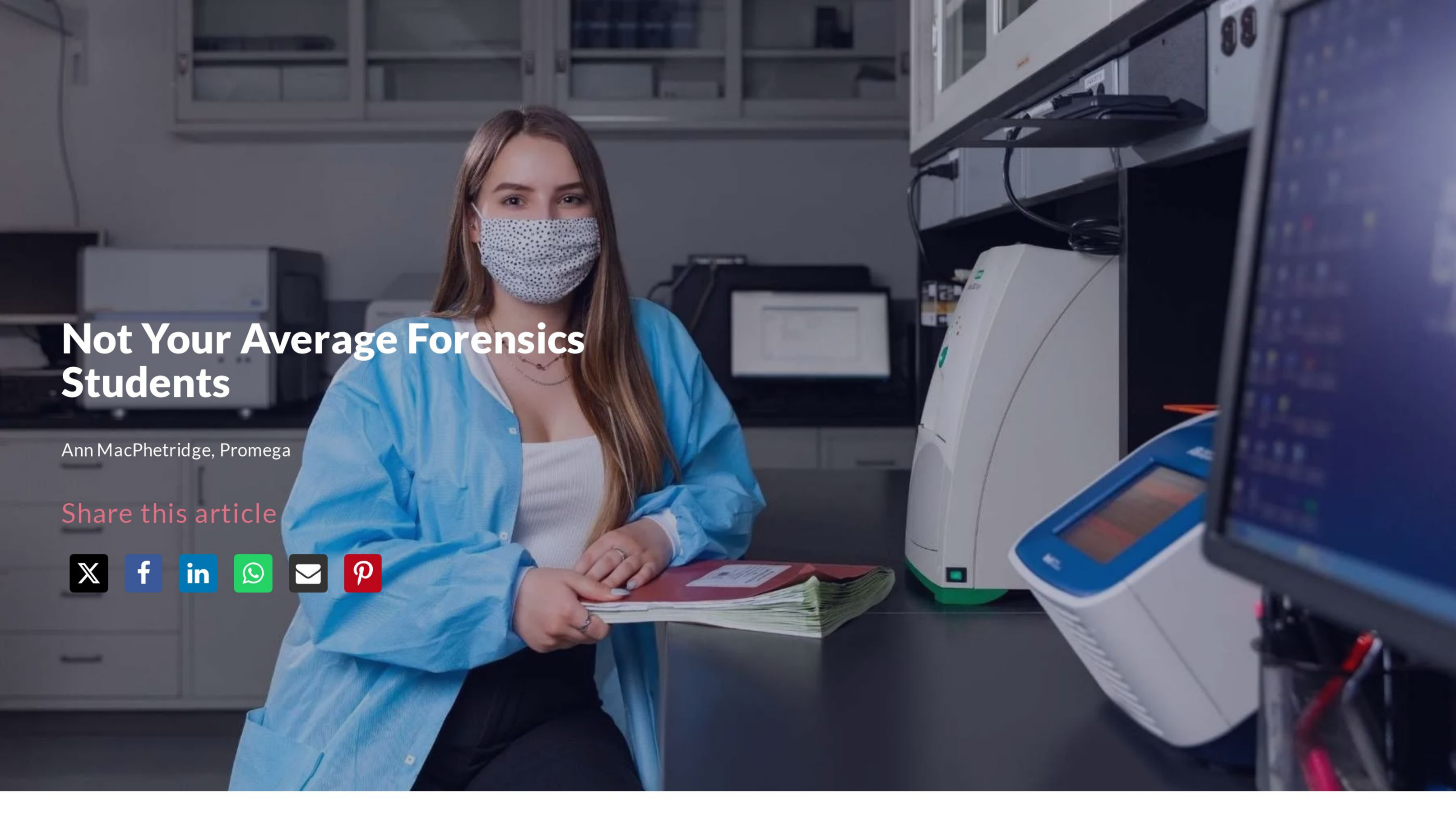

Not Your Average Forensics Students

Ann MacPhetridge, Promega

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I was lucky to have the opportunity to interview our Student Ambassadors for ISHI 32: Amber Vandepoele, Olivia McCarter, Nidhi Sheth, and Halley Fallang. Each of these young women are pursuing excellence in their own way. When a path isn't readily apparent, they simply make one.

I'm never quite sure what to expect during these interviews, and while I have a standard set of questions, I will often let the personality of the student ambassador guide the direction of the interview. As you can imagine, the four young women differ in personality and educational focus but are alike in that each are driven by a desire to have a real impact on forensics and to share their knowledge and passion for this field with others.

Nidhi Sheth

Nidhi, a PhD student at Rutgers University, is the first of my student interviews. She's got a smile that lights up the recording studio, and although she seems nervous about what I may ask her, she's also obviously open to whatever comes.

Nidhi's poster at ISHI described the research she's done on deconvoluting bulk mixture samples at the front end of processing to help solve complex mixture challenges. Her PhD work involves deconvoluting a mixture into single cells to separate epithelial cells, sperm cells and white blood cells, all of which are typically encountered in violent crime scenes. They then work to get a human profile from that single cell. Additionally, she's working under the guidance of her PI, Catherine Grgicak and collaborators to develop statistical tools for interpretation of single cells. According to Nidhi, "The amount of information that a single cell holds, just blew my mind, so I'm trying to get in-depth knowledge and trying to help in whatever way possible."

Nidhi's grandfather, a criminal lawyer in India has been her biggest inspiration. Lawyers run in the family, as her mother and many others on her mother's side of the family are attorneys. Her biggest drive to study forensics is the number of people looking for answers and justice, particularly those that are voiceless or that have been victims of abuse in their lifetimes.

She's driven to find justice for women, whether by assisting in the development of a new method that helps identify perpetrators or by working to find ways to reduce crimes against women. She recognizes that working in forensics provides opportunities to give back to the community and provide justice to victims.

"Just knowing that people need justice, that's my inspiration, and it's always been my inspiration. I am from India, and I read this article a couple of years that said that every 15 minutes, a woman gets raped. I have that article hung in my house, and when I walk out, I read that post every single day."

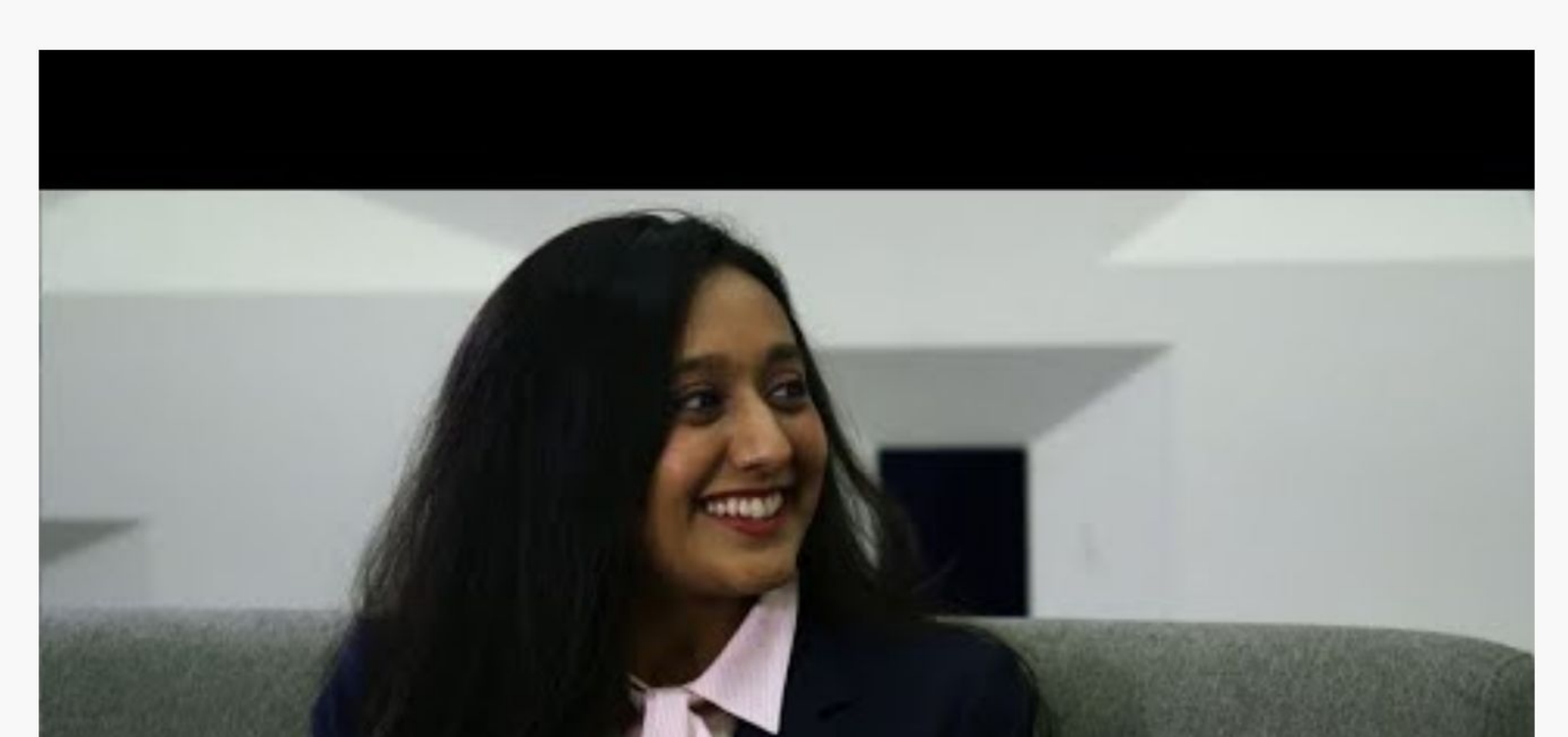
We move on to some getting to know you questions, the first one asking about what superpower she wishes she had. She smiles as she tells me that she wants to be Sherlock Holmes and to have his powers of deduction and his good eye for detail and observational skills.

An admirer of the Dalai Lama, she selects him when asked with whom she would choose if given the option to have dinner with anyone, dead or alive. She shares her curiosity about finding balance and peace within ourselves, especially when you don't have all the answers to questions, something that as a PhD student she's experienced on occasion.

As if pursuing a PhD wasn't enough of a challenge, Nidhi also is involved in a podcast, entitled "Beyond the Yellow Tape", where she and a colleague break down aspects of forensic science to inspire kids or others who may be considering a career in forensics.

To burn off the stress of experiments that didn't necessarily go as planned, she kickboxes and teaches dance. A trained classical dancer, she may have opted for a career teaching dance to children, instead of working crime scenes. I can't help but think of what a loss to the forensics community that might have been had she made that choice instead.

Nidhi describes herself as tenacious, hardworking, and dedicated to her work. I suspect that someone on the Promega ISHI team will be interviewing her at ISHI 52 about a breakthrough that she and her team have made in the study of forensic DNA.



Amber Vandepoele

Amber is a cheerful, outgoing conversationalist with infectious youthful enthusiasm. She first became interested in forensics elective course when she took a class in high school. A guest lecturer shared their experiences working as a forensic DNA analyst and she instantly thought, "I can do that!" From there she researched various programs at universities in the US, choosing Syracuse University, where she is an undergraduate studying forensics and biochemistry.

What drew Amber to forensics is the impact that it can have on people's lives. Her values come through as she shared her desire to help people.

"In a lot of scientific fields or at some companies in the field, the purpose isn't really something that I valued or related to. They're working to make money and not contribute to something. In forensics you can help families or bring some sort of closure. I want to be a part of something that is bigger than just you and doing your job."

Recognizing that it's more than just a job, Amber is enthusiastic about empowering women, BIPOC students and other marginalized groups to pursue careers in STEM, including the forensics field.

Amber's poster at ISHI was entitled "Phylogenetic Differential Separation of Environmental Samples: The First Step in Improving Mixed Species Sequencing Results". Currently casework laboratories target a single species, human DNA for amplification for genetic identity. Amber's work suggests that there are advantages to characterize multiple species as they may be able to provide additional probative information that can be used in the case investigation. Her research is designed to optimize methods that separate plant, microbial, and human cells into separate fractions. Separating these cell types enables laboratories to analyze each fraction as appropriate. By doing so, more complex DNA mixtures could be more easily interpreted and enable more information to be obtained from each sample. Additionally, they can use the microbial and plant fractions to assist in determining the location where a piece of evidence was originally.

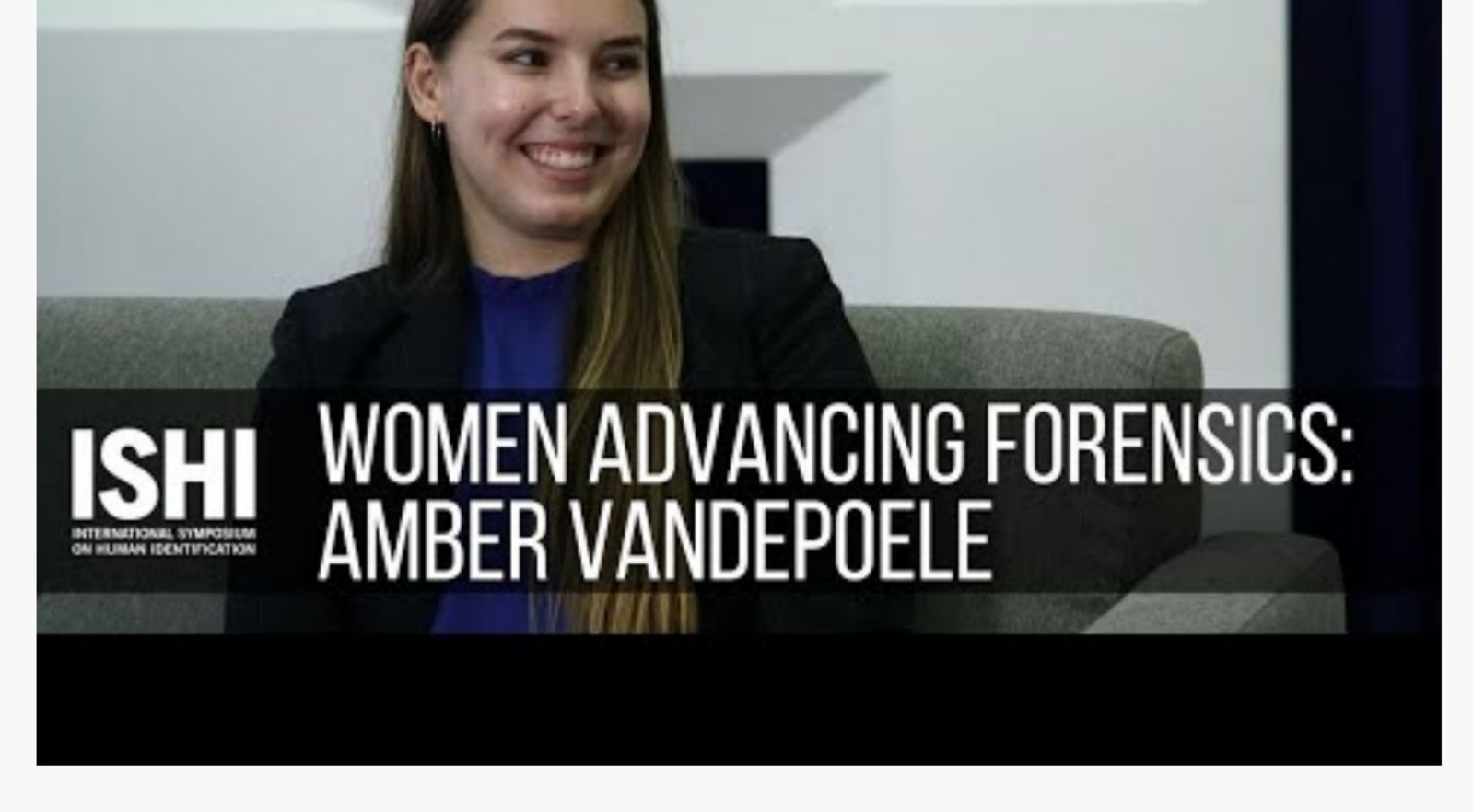
Though passionate about forensics, if she was to do something else, she would choose medicine, again for the ability to help and serve others. Her dream job is a DNA analyst at a crime laboratory. "I like the puzzle that comes with that as well as the lab work". Looking to the future, she would like to work in a crime laboratory in California, Atlanta, or Seattle. "Living in Syracuse, I've had enough experience with the cold and snow!"

Her interest in forensics extends beyond her school life. She often unwinds by watching true crime and forensics shows. "Any Netflix documentary on true crime—I love it!"

Smiling shyly, she told me that honest, funny, and driven were the best descriptors for herself. She tries to balance the seriousness of her studies and her laboratory work with sarcasm and humor. A foodie at heart, Amber loves going with friends and family to explore new restaurants. "If I'm not doing something, I'm like let's go eat!" The Obamas make the top of her list for dream dinner companions.

Amber is not a fan of flying after having a couple of miserable experiences at airports recently so she chose the ability to fly as her most desired superpower. "I've had some stories, so I would love to be able to fly anywhere for free!"

Amber focused her time at ISHI networking with various vendors, speakers and her fellow students. Her favorite part of ISHI was visiting the exhibit hall and talking to vendors about their products and what new technologies they had for crime laboratories.



Olivia McCarter

Dressed casually in a t-shirt and jeans, Olivia strikes me as your typical teenager. What I soon learned, however, is that she is anything but typical. In fact, Olivia solved her first cast at age 18 using investigative genetic genealogy (IGG) tools. Olivia focuses her work in the Southeastern US, primarily in Alabama and Mississippi, working on infanticides and child homicides.

Olivia has been interested in forensics from a young age. Reading about the success with the Golden State Killer case motivated her to reach out, even though she was still a high school student, to those working in IGG, asking what she could do to help. It's clear she's found her calling—she has this laser intensity and focus as she describes what doing this work means to her. She's made this her career, despite not being old enough to drink alcohol in most states.

"I didn't know that I wanted to do genealogy for the rest of my life until after I solved my first case. That was Harry who was identified in April of 2020. His family knew of his death, but his body wasn't recovered until we gave him back to them and they buried him.

There are just so many people out there who haven't been identified. There are more than 100K in the US alone who are unidentified. All of them have families. All of them were people just like you and me. They could have been sitting right next to me. So that's what really drives me--giving these people back to their families."

Her poster at ISHI described the IGG work she's doing to solve infanticide cases. "In my poster I describe my biggest passion—the use of IGG for solving Infanticide cases, children under the age of one. I give an example of case that hasn't been solved yet from Jackson County, MS…"

Olivia feels a strong connection to the victims of the crimes she investigates. It's clear when talking to her that she internalizes these cases while working them and works tirelessly to find answers. She maintains relationships with loved ones of the victims, considers them and the victim to be her family. One touching detail she shares with me is that she creates a nickname for each of the unidentified victims, rather than referring to them as Jane or John Does. She adamantly believes that these aren't just case numbers, but that there are real people, real children involved in these horrific cases. Her connection to these victims is evident and I hear the emotion in her voice as she says, "We give them names to call them, and we love them until we can give them back to their family".

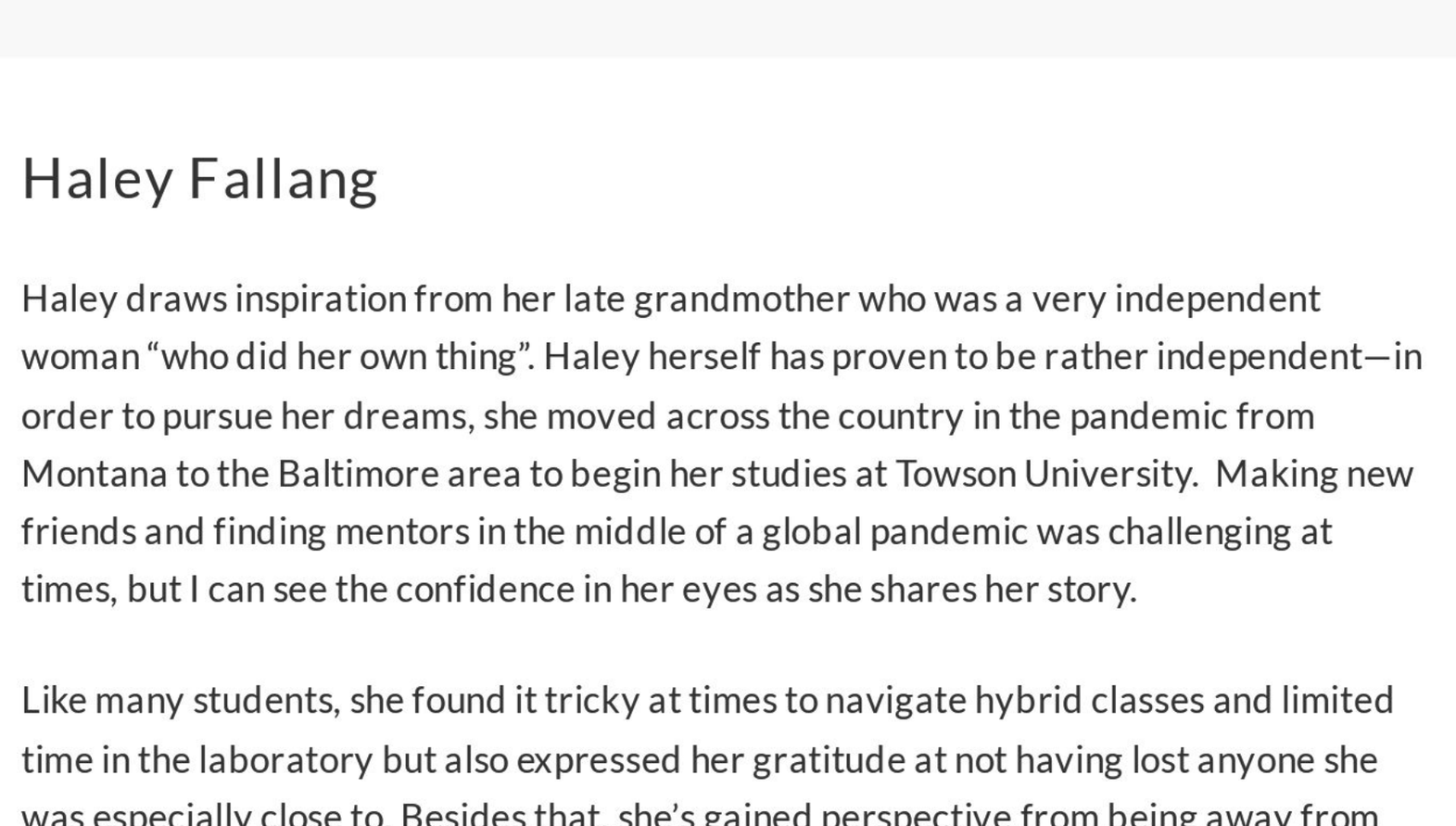
Her dedication to the victims is so strong that after a case is solved, she gets a tattoo to remember each victim. She proudly shows me a tattoo on her lower arm, one of three small flowers just like those that were on the dress of one of young victims, Alisha Ann Heinrich, an 18 month old toddler who was partially smothered before she was thrown alive from the eastbound Interstate 10 bridge into the Escatawpa River, where she ultimately drowned.

The mother in me can't help but ask how she is able to separate herself from these cases and to take care of herself especially when she is barely out of childhood herself. Fortunately, the IGG community has been very supportive and watches over her, offering her advice and protecting her from those in the community who are too competitive or "cutthroat" in their approach.

"I do take care of myself. My team makes sure we take care of ourselves… We make it a point to take care of each other. We watch movies over Zoom together, once a week we might watch our favorite tv shows and just hang out where we don't talk about the forensics work, don't talk about anything related to genealogy. We just have fun and take care of one another. They're my family and have really grounded me and taken care of me.

"This is a new field, it's very competitive, but there are people who are taking care of me, making sure that I'm protected and don't have to deal with some of these people."

Not surprisingly, Olivia's dream job is exactly what she's doing—investigative genetic genealogy. Just before our interview she had received news that she would be working alongside a detective in Mobile County, Alabama to head up the Cold Case unit there. There work would cover not only Mobile County cases but would give them an opportunity to take on cases from "all over Alabama from agencies that don't have the money or manpower".



Haley Fallang

Haley draws inspiration from her late grandmother who was a very independent woman "who did her own thing". Haley herself has proven to be rather independent—in order to pursue her dreams, she moved across the country in the pandemic from Montana to the Baltimore area to begin her studies at Towson University. Making new friends and finding mentors in the middle of a global pandemic was challenging at times, but I can see the confidence in her eyes as she shares her story.

Like many students, she found it tricky at times to navigate hybrid classes and limited time in the laboratory but also expressed her gratitude at not having lost anyone she was especially close to. Besides that, she's gained perspective from being away from the lab and it has brought about a bigger appreciation for that time in the lab and for how impactful and meaningful attending conferences such as ISHI can be for meeting new people who are pursuing similar work.

"ISHI has been so awesome, talking with vendors hearing from experts in the field and fellow students. Being able to listen to new perspectives and hear about new techniques that are coming out, it's just been awesome."

Haley's poster at ISHI provided details on her work on mitochondrial DNA and using next generation sequencing on historical human remains that were discovered in Maryland. She shares that although the science is a key part of this work "at the end of the day you're trying to tell the story of this individual and to determine the haplogroup of this person."

Of all the scientific majors she could have pursued, forensics was the most interesting to her, particularly for the way that forensics is a tool to identify the victim or identify the perpetrator and bring them to justice.

"I've kept with forensics because I believe that every individual has an innate dignity. And when an attempt is made on that person's life it's a way to also eliminate that dignity. I think it's so special to use scientific skills to serve our communities. That's really why I want to go into the forensics field."

Her dream job in forensics field is to be a DNA analyst in a crime lab, although she sees value in research and would also like to pursue a PhD to further advance the field.

Haley's advice to young people who are considering studying the life sciences is to explore the variety of disciplines and take a variety of classes to get a feel for what excites them. "Explore as much as you can and you'll find what your passion is." An avid hiker in the Montana mountains and a theme park fanatic, she doesn't shy away from adventures.

Now it's our time for the getting to know you questions. I'm fascinated to hear that Princess Diana would be her choice to have as a dinner companion. But she explains that she and her mother both love Princess Diana because Diana had more lessons to share with the world, especially around serving the world and those less privileged than you. "She had a special light within her and a desire to serve others".

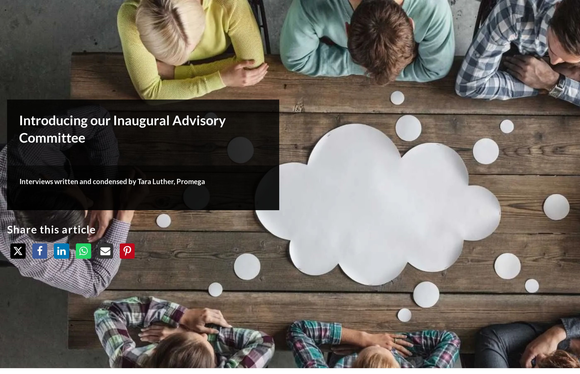
The classic quote from the movie, *Forrest Gump*, "Life is a box of chocolates. You never know what you're going to get" is one she most relates to, especially given the opportunities and challenges and not knowing what's coming to next. Her positivity shines through as she talks about the importance of how one responds and approaches those challenges.



As I reflect on my brief time with each of our Student Ambassadors, I'm filled with gratitude for the opportunity to talk with them about their dreams and inspiration as well as the research they're undertaking as students. These women have already achieved a great deal at their young ages; I can't help but be eager to see what's next for them and to imagine where they may be in 10, 15 and 20 years.

If you're a student pursuing forensic science as a degree and are interested in learning more about the ISHI Student Ambassador program, I invite you to see page 12 for more details on how to apply.

We've also created a student resources page on our website as well as a listing of available jobs and internships in the forensic DNA field.



Introducing our Inaugural Advisory Committee

Interviews written and condensed by Tara Luther, Promega

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The ISHI planning team has expanded by six members as we've formed an inaugural advisory committee. The committee was formed to steer the content and format of the annual symposium to reflect the interests of the diverse stakeholders in the forensic science community.

We will be conferring with the advisory committee throughout the planning of the ISHI conference, and are grateful for the experience and expertise that they bring.

Below, we introduce the six members who make up the committee and get to know them a little better.



Ronaldo Carneiro da Silva Junior

Custodian of the National DNA Database, Brazilian Federal Police

View profile



Dr. Claire Glynn

Associate Professor, University of New Haven

View profile



Brian Hoey

Laboratory Director, Missouri State Highway Patrol

View profile



Deedra Hughes

Assistant Director/CODIS Administrator, Mississippi Crime Laboratory

View profile



Brian Kim

Criminalist, Los Angeles Police Department

View profile



Dr. Nicole Novroski

Assistant Professor at the University of Toronto, Mississauga

View profile

Why were you interested in participating in the advisory committee and what do you hope to contribute?

Ronaldo: I am passionate about scientific events and I really appreciate the idea of sharing my passion with other people who feel the same way. Participating in the elaboration of scientific agendas and discussing topics of interest is something I really appreciate.

I should mention that I am also very honored to represent Brazil and all Latin American countries on the Advisory Committee. I want all forensic scientists in these countries to feel represented, and that they identify even more with ISHI. I want to help make the program reflect the aspirations of the Latin American scientific community.

Finally, I am really excited to support the organization of ISHI in making the symposium a unique experience for attendees.

Claire: ISHI has always been such a valuable resource to me for keeping up to date with new developments and for connecting with a broad range of practitioners and academics across the forensic DNA industry. Collaboration and a sharing of knowledge/expertise can only strengthen the industry as we continue to build a path forward and advance the field. I enthusiastically joined the advisory committee when I was invited, as I saw it as an opportunity for me to give back to our community. I hope to contribute by helping the ISHI team to create innovative ways for forensic professionals to engage with each other and share developments in the field. The annual ISHI meetings are incredibly valuable for those that attend, and so I also hope to contribute to the planning, design, and implementation of future meetings to help further their impact.

Brian Hoey: I have a lot of respect for my colleagues at Promega and was honored to be asked.

Deedra: My willingness to serve wherever asked and my love for the ISHI meeting contributed to my participation. This is the premier DNA conference and I wanted to be a part of making it even a greater success.

Brian Kim: I was interested in participating in the advisory committee because I was very interested in learning about the topics and subjects that were submitted and available for ISHI workshops and seminars. I'm hoping to provide the perspective of an active DNA casework analyst and try to spotlight talks that may benefit bench analysts.

Nicole: As an early career researcher in the field, I am always interested in learning and contributing new ideas where I can. Being a member of the advisory committee provides me with the opportunity to share my ideas as well as work with a diversity of new colleagues to develop ideas and potential talks/events that will be informative and poignant to all attendees. Further, by incorporating feedback from colleagues and others in my network back to the ISHI advisory committee, I hope that I can contribute relevant yet impactful feedback that will shape future meetings to best serve the needs of the community.

How many ISHI meetings have you attended and in what capacity?

Ronaldo: I attended two ISHI meetings: 2020 and 2021. In both I was Chair of GCLAITH (Grupo Científico Latino-Americano de Trabajo Sobre Identificación Humana/Latin American Scientific Group on Human Identification Work) workshop. Unfortunately these meetings were virtual. So I'm really excited to meet all the participants in person this year.

Claire: Last year I attended the ISHI meeting in-person, and I also had a vendor booth to represent the University of New Haven and our forensic programs. I really enjoyed speaking with so many people from a broad range of professional forensic disciplines.

Brian Hoey: About 10.

Deedra: I have attended 16 ISHI meetings. My capacity included attendee and moderator.

Brian Kim: I've attended two ISHI meetings in the past including the virtual ISHI conference. I've gone as an attendee and I've had the opportunity to present as a speaker once.

Nicole: So far, I've attended six in-person meetings (2014-2017, 2019 and 2021) and one meeting remotely (2020). My capacity has varied between regular attendee and presenter, where I have typically always presented at least a poster presentation (with two oral presentations under my belt and in a moderator capacity in 2021).

What is your favorite thing about the conference? Do you have any memories from a past ISHI meeting that you'd like to share?

Ronaldo: At the ISHI meeting we have the opportunity to learn about the most modern tools in forensic genetics. It is an event that presents us with the most current technologies applied to the forensic area, which is a differential.
I also highlight the friendly atmosphere of the symposium. It allows attendees to feel welcomed and comfortable to participate and exchange experiences.

Claire: Connecting with other forensic professionals and having conversations that stimulate new ideas and new collaborations is one of my favorite things about the conference. But my absolute favorite is always the Keynote. At last year's meeting (2021), I found Mark Desire's Keynote presentation remembering 9/11 and the OCME's continued efforts to be particularly impactful on me. It was a stirring reminder of the importance of the work forensic professionals do and the need to continue advancing our technologies even further.

Brian Hoey: The comradery and culture of the DNA community. I've met many of my longtime friends at ISHI.

Deedra: My favorite thing about the ISHI conference is the offsite events. We, as scientists, deal with difficult circumstances on a daily basis. Being able to let your hair down, while socializing and having fun with your colleagues allows you to refocus. Refocusing allows you to be able to continue to provide service in the field of Forensics.

Brian Kim: My favorite things about ISHI is meeting people from the international forensic community and seeing how they operate and tackle issues differently. I also enjoy the talks to learn about new technology or techniques. The food (and drinks!) are great too.

Nicole: My favorite thing about ISHI is the relaxed atmosphere of the conference coupled with the opportunity to reconnect/network with global collaborators. The program is always very engaging and diverse and allows for professionals in multiple roles within the forensic community to present their work. I really believe that this conference has something for everyone, and the energy is always incredibly positive. Further, the social events are the best of all the conferences, and really encourage extended networking opportunities and a change to get to know professional colleagues on a more personal level.

One of my favorite ISHI moments was winning against John Butler at the (gun draw) shootout game in Phoenix, Arizona (2014) at the offsite western event. As a student who didn't know all of the "famous" senior forensic researchers, the event was really impactful.

What Do They Mean in Forensic Science?

Ken Doyle, Promega

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Whenever I have to fill out a form with a "race" question, I'm bemused (and perhaps amused) by the options. As someone of Indian origin with a diverse family tree, I often pick the "Asian" option. However, within the US, "Asian" is generally understood to mean someone from East Asian countries, predominantly China or Japan, ignoring the Indian subcontinent and other countries that collectively make up the majority of Asia's population. In contrast, in the UK, Asian typically refers to people from South Asia, especially those from India or Pakistan. Some forms take the issue further, adding an "ethnicity" question that divides the world into Hispanic and non-Hispanic populations. This confusion leads to the question of what, exactly, race is. Does it have a biological basis, or is it an arbitrarily defined social construct?

Many branches of science, including DNA forensics, struggle with the concepts of race, ethnicity and ancestry. There are no universally accepted definitions of these terms, and confusion about their use is prevalent in science as well as outside it. This confusion is well recognized in fields such as clinical genetics, where categorizations by race, ethnicity or ancestry are used to report health data. A study that surveyed clinical genetics professionals and researchers found that a majority of respondents considered race, ethnicity and ancestry at least somewhat important for genetic testing and communicating results to patients (1). However, there was no consensus around how these parameters should be used and what information they could convey in clinical genetics. The authors noted this lack of consensus could contribute to misleading or inconclusive results when interpreting clinical genetic data, calling out the need for standardizing race, ethnicity and ancestry in clinical data collection and interpretation.

Forensic DNA Databases

Forensic DNA analysis faces the same ambiguity when it comes to addressing race, ethnicity and ancestry. "Unfortunately, ancestry, race and ethnicity are often used interchangeably, even though each concept varies significantly across historical and contemporary national borders and time," says Sree Kanthaswamy, PhD. Dr. Kanthaswamy is Professor of Genetics and Forensic Science/School of Mathematical and Natural Sciences at Arizona State University. Together with doctoral student Robert F. Olstt, Dr. Kanthaswamy has published a detailed study of the relevance of race in forensic DNA databases that use the Combined DNA Index System (CODIS) short tandem repeat (STR) panel (2).

These databases are used in criminal investigations as part of random match probability (RMP) calculations—the probability that a random, unrelated person from the general population has a DNA profile matching that of the suspect. Alternatively, analysts may calculate the likelihood ratio (LR), using Bayesian analysis. The problem, Dr. Kanthaswamy says, is that "RMP estimations, which are calculated from racially subdivided genetic databases, assume that 'races' are meaningful biological categories." It is widely assumed that, to compute the most conservative RMP (favoring the defendant), the defendant's self-declared racial reference DNA database should be used. When a defendant's race is unknown, in the US, RMPs are computed across reference race-based CODIS STR allele frequency databases consisting of African American, Asian, Caucasian, Hispanic, and Native American categories. Racial information is not formally included in any steps preceding forensic DNA analysis, yet it is used for the RMP calculation and interpretation.

In their study, Olstt and Kanthaswamy evaluated the relationship between RMP and race in the continental US (2). "Based on this study," Dr. Kanthaswamy says, "the use of racial information does little to generate conservative RMP estimates." Therefore, using race as a proxy for genetic distinction to produce larger (i.e., conservative) RMPs for an individual DNA profile is unnecessary. He adds, "In fact, we believe that using race information at this stage of DNA analysis may be prejudicial, especially when presented to the jury during trial."

Expanding on the results of the study, Dr. Kanthaswamy explains that the analysis of CODIS STR profiles using the five race-specific allele frequency databases could not distinguish individuals separated by race as distinct genetic clusters. "These analyses confirm that most genetic differences between individuals are only to the slightest extent attributable to racial classification, as almost 98% of the genetic variation was found to occur among individuals and not between races," he says. Therefore, RMP values—which were computed as exceedingly small, regardless of allele frequency database—did not vary to any significant degree when incorporating race-specific reference data.

Instead of race or ethnicity, Dr. Kanthaswamy recommends using genetic ancestry in forensic DNA databases. He explains that genetic ancestry can be traced through pedigree or genealogical history. "The rigid form of categorizing people in the US into different racial or ethnic groups is based on a mixture of their physical traits, behavioral characteristics, cultural and linguistic attributes, and geographic origins," he adds. In forensic DNA analysis, underlying biological factors that can unequivocally group people into discrete racial and ethnic categories are nonexistent. Further, he says, "When we only focus on discrete racial and ethnicity categories, we ignore the level of admixture among people of different origins." This issue has resulted in mixed-race individuals not being clearly defined and undercounted in forensic DNA databases.

"We hope that our results highlight the clear disadvantage of using racial classifications to generate forensic identity estimations, especially in the US," Dr. Kanthaswamy says. "A promising avenue from our findings is that eliminating racial or ethnic groups during RMP calculations may be critical for accurate and unbiased DNA analyses and interpretation." As forensic DNA technology advances, especially the ability to extract usable DNA from ever smaller and more degraded pieces of evidence, he emphasizes the importance of using accurate and unbiased database methods.

DNA Phenotyping

As massively parallel sequencing (MPS) grows in popularity among forensic laboratories, it continues to revolutionize forensic workflows originally based on capillary electrophoresis. DNA phenotyping is one example of a forensic method transformed by MPS technology. This method uses a DNA profile to predict features related to physical appearance, such as eye, hair and skin color, as well as biogeographical ancestry (reviewed in 3). The technique originally analyzed a small set of autosomal single-nucleotide polymorphisms (SNPs) associated with these physical traits. With DNA microarray technology or MPS, however, the number of SNPs that can be analyzed simultaneously increases greatly (3).

Forensic DNA phenotyping has attracted considerable attention for its potential to help with investigating crime, and it has been compared favorably to eyewitness evidence. At the same time, concerns have been raised about objective interpretation of the results and whether investigations can be biased against minority racial or ethnic groups (reviewed in 4).

Parabon NanoLabs is a leading DNA technology company that offers forensic DNA phenotyping among its Snapshot® DNA analysis services. Ellen Greytak, PhD, Director of Bioinformatics at Parabon NanoLabs, addresses the issues surrounding race, ethnicity and ancestry in the context of DNA analysis. "Race and ethnicity are categorical descriptors," she says, "and we do not use them in our reports. We talk about ancestry as a continuous measure of how much of a person's DNA comes from each population (admixture analysis), and how similar a DNA sample is to reference individuals with known ancestry (principal components analysis)."

Dr. Greytak emphasizes that DNA phenotyping produces an objective physical representation of an unknown individual that is not biased by an observer, as may happen with eyewitness accounts. The main use for the technology is in cases where there are no eyewitness accounts. "Phenotyping has been used in many cases where detectives think they have a description of the suspect, and they would like to confirm or refute that description", she says. In cases where eyewitness accounts are inconsistent with the DNA evidence, Dr. Greytak notes that DNA phenotyping can prevent an investigation from moving in the wrong direction. She cites an example of a 2009 homicide case in Louisiana where investigators had been searching for a Hispanic male based on the victim's cell phone records. "DNA phenotyping analysis of DNA from the crime scene showed that it came from a Northern European male with blue eyes," Dr. Greytak says. The investigative agency released the Parabon Snapshot® report, which ultimately led to a tip and arrest of the perpetrator.

Population genetics studies often rely on what are called ancestry-informative markers (AIMs)—a set of genetic variants that show significant frequency differences across populations. "We do not use AIMs for our ancestry analysis," Dr. Greytak says, "but rather tens of thousands of SNPs across the genome, which makes our ancestry results far more precise than can be accomplished with AIMs." As mentioned earlier, the reports that Parabon provides do not discuss race or ethnicity. Rather, they assess biogeographical ancestry, "which is a continuous measure of the genetic origin of one's ancestors that is passed down through the DNA," Dr. Greytak explains.

DNA phenotyping, as part of forensic genetic genealogy, can be a powerful tool. One area where it cannot provide information currently is age. As technology advances, however, Dr. Greytak hopes that gap may be filled by analyzing epigenetic DNA methylation patterns, using techniques such as bisulfite sequencing (5).

Forensic Anthropology

As with other branches of forensic science, technological advancements have led to growth in the use of forensic anthropology, especially in cases involving missing persons or unidentified human remains. Although DNA analysis has gained popularity in recent years, it is often used along with physical identification methods—such as facial imaging, bone microscopy, dental reconstruction and radiioisotopic analysis—that form the foundation of forensic anthropology (6,7).

This discipline has seen its share of debates over race, ethnicity and ancestry—perhaps more so than any other branch of forensics. Anthropological assessments provide information on ancestry, and it is widely recognized that race is a social, not biological, construct. However, some forensic anthropological methods are rooted in a history of dividing humans into "racial types", and interpretation of forensic anthropological data can still be subject to racial bias (8).

Often, forensic anthropological estimates of ancestry in the US are used as a proxy for social race. Shanna Williams, PhD, is an Associate Professor at the University of South Carolina School of Medicine—Greenville. Together with Dr. Ann Ross, she conducted an extensive content analysis of publications in the Journal of Forensic Sciences from 2009 to 2019, examining the confusion around the nomenclature used in ancestry estimation studies (9). The study also questioned the validity of the so-called tricontinental approach to categorizing ancestry information as African, Asian and European.

According to Dr. Williams, "The term 'ancestry' should reflect human biological variation through a lens of population structure grounded in microevolution." The common practice of using craniometric analysis or macromorphoscopic traits (slight variations in cranial form) relies on the assumption that skeletal morphology correlates with ancestry. In this approach, statistical methods are used to analyze 2D or 3D data collected from the cranium to predict the probability of an unknown individual classifying into a known reference population. Dr. Williams emphasizes that multiple macromorphoscopic traits should be used in ancestry estimations and accessed using the appropriate statistical classification method to ensure they are properly weighted. "However, in recent years," she says, "forensic anthropologists have begun pushing back on the utilization of such traits, questioning their biological validity."

In the content analysis study (9), Dr. Williams found numerous examples where the term "ancestry" was applied to racially or ethnically defined samples, such as Black, white and Hispanic. She says, "This suggests, at best, a lack of consistency and consensus in the usage of the word 'ancestry' and, at worst, a return to the debunked biological race concept that humankind can be winnowed into a small number of discrete groups using a less socially loaded term." Unfortunately, as the study points out, ancestry has simply become a synonym for race in forensic anthropology.

To address the issue, Dr. Williams says that "a fundamental and structural paradigm shift is needed, which represents a more biologically and socially complex approach to human population variation." One possible solution she proposes is to apply a population-structure approach to ancestry estimations. The approach would use craniometric analysis to consider how major historical events—such as population migrations, language differences and spatial patterning—are impacted by microevolutionary forces. In turn, the approach would seek to understand how these historical events influence cranial morphology. "This approach better captures the interplay between biology and culture, while steering clear of outdated typological methods constructed upon debunked notions of biological determinism," Dr. Williams concludes.

Conclusion

The assumption that race can be determined from a person's DNA or bones is pervasive, yet there is no biological foundation for that assumption. It's clear that confusion surrounding race, ethnicity and ancestry still exists among forensic analysts. Changing misguided perceptions and bringing clarity to these issues will take time and involve a fundamental change in how we think about race.

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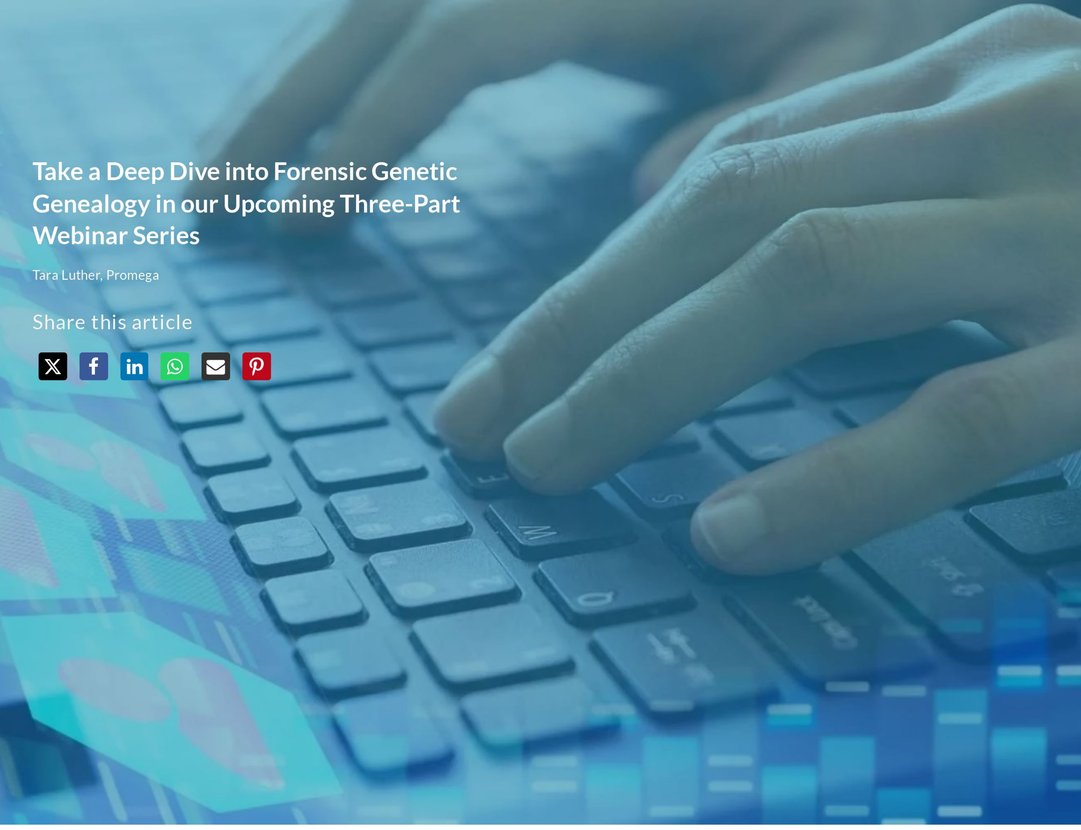

Take a Deep Dive into Forensic Genetic Genealogy in our Upcoming Three-Part Webinar Series

Tara Luther, Promega

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In 2018, a new tool for crime solving rose to prominence as the notorious Golden State Killer was finally unmasked. For years, Joseph James DeAngelo remained under the radar until investigators in the case partnered with genealogist Barbara Rae-Venter. Using genome-wide testing to generate a comprehensive DNA profile, the team turned to a genetic genealogy website where users came to learn more about their roots.

Since 2018, over 200 suspect cases have publicly announced the use of forensic genetic genealogy (FGG) for lead generation. Much has been learned on how to best work cases using FGG since 2018 and guidelines have been established and published by the Department of Justice, the Scientific Working Group on DNA Analysis Methods (SWGDAM), and the Sacramento District Attorney's office. Yet there are questions that still remain as the path forward for FGG solidifies.

What types of cases are best suited for FGG?

What will labs and prosecutors face when taking these cases to court?

What technologies are best for generating a DNA profile suitable for FGG or how do you choose a genealogist to work with?

To address some of these questions, we've recruited some expert speakers to present ISHI's first webinar series. This three-part webinar series will be free to viewers and will help provide some additional foundation on FGG before we gather for ISHI 33.

The series begins on April 13th with Steve Kramer and Steve Busch of Indago Solutions. Steve Busch was an FBI Special Agent for 19 years, during which he co-founded the FBI's forensic genetic genealogy team and was an architect of the FBI's National FGG program. Previously Mr. Busch worked investigative assignments including counter terrorism and complex financial crimes. He also honed his leadership skills as a SWAT Sniper Team Leader, routinely solving multifaceted problems in a high threat environment. He is departing the FBI pre-retirement to develop market disrupting Automated Identity Resolution software. A former Civil Engineer, he has a B.S. in Engineering from Cornell University and was a captain on Cornell's football team.

Steve Kramer was the FBI in-house counsel for 20 years, where he was responsible for legal matters in the FBI's criminal and national security investigations and oversaw the FBI's investigative techniques and strategies. Previously Mr. Kramer worked as a federal prosecutor, and deputy district attorney, where he prosecuted homicide cases, corporate fraud cases and national security cases. After assembling and leading the team of investigators that solved the notorious Golden State Killer case, he finished his career at the FBI as the cofounder of the FBI's forensic genetic genealogy team. Mr. Kramer has an accounting/finance degree from the University of Arizona, a JD from California Western School of Law, and an MBA from the UCLA.

On April 13th, Mr. Busch and Mr. Kramer will be discussing the origins of FGG, best practices for law enforcement, probable cause and legal considerations, and common myths surrounding FGG. They will also be available for a live Q&A following their session, so be sure to have your questions ready.

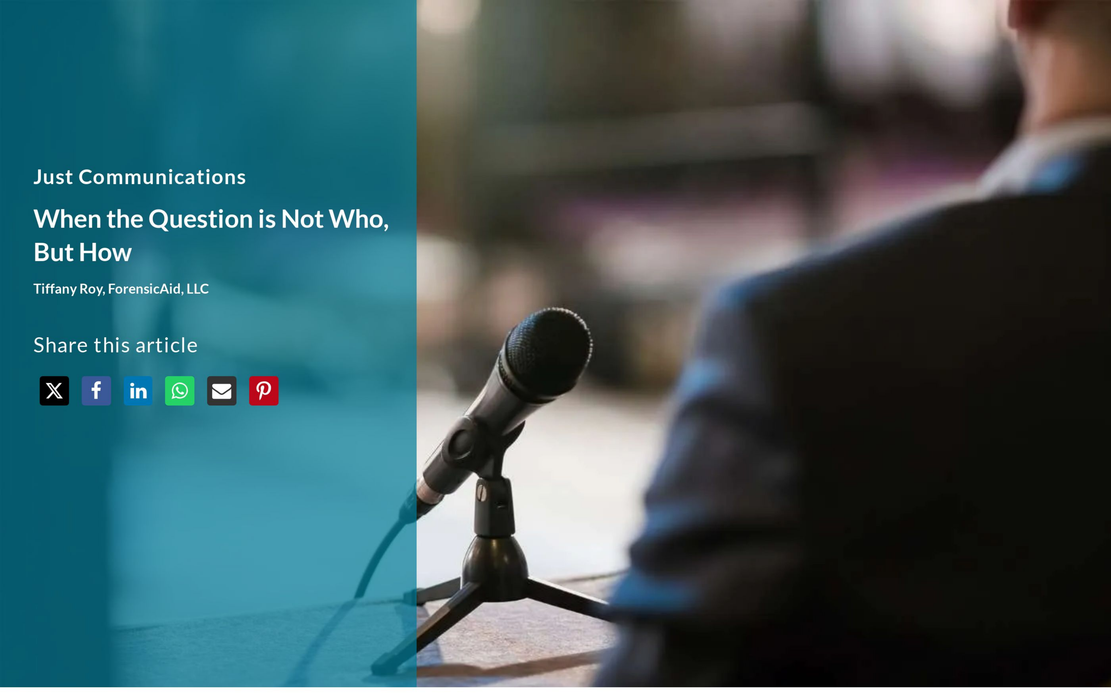
The next webinar will be presented on May 4th by Rachel Oefelein of DNA Labs International. Ms. Oefelein is currently the Director of Research and Innovation, Quality Assurance Manager, and a Senior DNA Analyst at DNA Labs International (DLI). Additionally, she is a PhD candidate with Griffith University located in Brisbane, Australia. She received her MSc in Forensic Science from the University of Strathclyde, and her BS in Criminal Justice, with a Forensic Science Minor, from Loyola University of New Orleans. Ms. Oefelein worked at the Armed Forces DNA Identification Laboratory (AFDIL) for nearly five years and previously interned at the Instytut Ekspertyz Sądowych, the Forensic Laboratory in Krakow, Poland. Since joining DNA Labs International in 2014, she has testified in eleven Florida counties, five states and U.S. Territories, and five countries as an expert witness for both the prosecution and the defense in misdemeanor and felony trials, as well as Williams, Daubert, and Arthur hearings.

Ms. Oefelein will address how to generate a profile suitable for genealogy upload, the bridge between generating genealogy data and genealogy research, confirming investigative leads with STR comparison, and expert witness testimony as it pertains to cases that utilized FGG. Ms. Oefelein will also be available for a Q&A session following her presentation.

Finally, on May 25th, Danny Hellwig of Intermountain Forensics will present on methodologies you should know when considering FGG. Mr. Hellwig holds an M.S. in Forensic Science and is a 16+ year veteran of both Public and Private Crime Forensic DNA Laboratories. He has served as a DNA analyst, technical leader and in executive management of Forensic DNA laboratories over that time. He has provided training to hundreds of Forensic DNA labs and conferences on a variety of different topics. Armed with a black belt certification in Lean/Six Sigma process improvement and extensive experience in both quality and operational leadership, he provides executive direction and oversees the quality system of the Intermountain Forensics laboratory.

FGG is responsible for a paradigm shift in the forensic DNA world. The forensic DNA scientist needs to be well versed in the pros and cons of the laboratory instrumentation, processes and profiles that are used in the generation of genetic genealogy results. These are often technologies that we are unfamiliar with. In his presentation, Mr. Hellwig will assist and supplement the forensic DNA community's knowledge of the processes of targeted SNP assays, micro-array and the multitude of whole genome sequencing options available.

Details on how to register for this webinar series will be coming soon on our website (www.ishinews.com). If you'd prefer to receive email communication regarding ISHI and the upcoming webinar series, we invite you to sign up for our email list on page 13 of this magazine.



Just Communications

When the Question is Not Who, But How

Tiffany Roy, ForensicAid, LLC

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Forensic DNA analysis in the US has undergone some significant changes in the last few years. As laboratories move toward probabilistic analysis using the likelihood ratio, analysts and lawyers are grappling with a new mathematical framework in court. Where we used to assign weight to DNA profiles using frequentist probabilities, we now construct ratios of probabilities using Bayes Theorem. The language being used to describe forensic DNA results in courtroom testimony using these new tools is very different from ways analysts have described their results in the past.

Under the new framework, DNA results are evaluated given opposing propositions. One proposition is intended to represent prosecution and defense allegations in a criminal trial. In 1998, Evett et al first described a hierarchy for propositions, initially describing three levels. Since then, the hierarchy has been expanded to describe five different levels. The first few levels describe an examination of evidence given source level propositions. Historically, DNA results in the United States addressed this level of the hierarchy: Whose DNA is present on the evidence?

The next level of the hierarchy deals with evaluating findings given proposed activities. When the information the court needs isn't about whose DNA might be on the item, but rather how the DNA came to be there, an evaluation of propositions on the activity level may be most appropriate. Because US Laboratories are just familiarizing themselves with Bayesian models, it is not yet standard practice to perform evaluations of evidence given proposed activities. In court, however, it is common for lawyers to ask hypothetical questions regarding activities that may have given rise to a DNA profile on an evidence item.

Answering questions about how DNA may have gotten on an item can be a tricky spot for a few reasons. First, stating that all proposed activities are "possible" may not be helpful to the court and not all proposed activities may be equally likely.

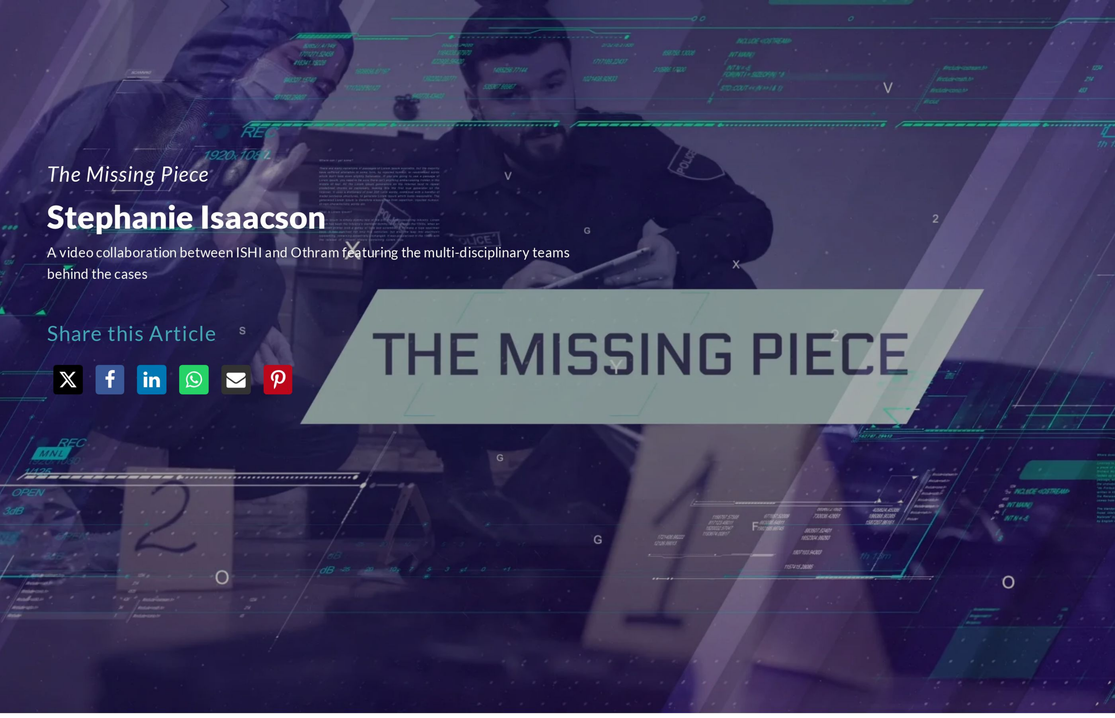
Second, in true activity level evaluations, the analyst never comments on the likelihood of the activities. How DNA came to be found on an item of evidence is most often unknown and unknowable for the analyst. While an evaluation of evidence given proposed activities may be possible, commenting on the likelihood of the activities themselves is an example of the prosecutor's fallacy, the transposed conditional.

Third, evaluations of findings given proposed activities require complex analysis of concepts of DNA TPPR: transfer, persistence, prevalence, and recovery. In forensic DNA, it is recognized that a laboratory should have a procedure for this analysis, that it should be technically reviewed and that it should be contained in a written report. The benchmark of reliable forensic science is that it falls under the umbrella of a robust quality assurance program, within the scope of accreditation. If a laboratory doesn't have a procedure for performing these analyses and they're not contained in a written report, they are not within the scope of quality assurance. If an opinion isn't reflected in the report, it hasn't been subject to technical review.

So, what should an analyst do if they find themselves on the witness stand being faced with questions about activity? If no activity level evaluations were performed, just say that. It is improper to speculate about results from DNA samples we didn't test. This concept also applies to evaluations on other levels of the hierarchy. Make clear to the court that the opinions contained in your report and expressed on the witness stand pertain only to evaluations of evidence given who might be a contributor. Consider including a statement in the written report as well as on the witness stand that the likelihood ratio only applies to opinions about whose DNA may be present and does not address questions of how the DNA got there. This is the best way to ensure your opinions are being clearly and accurate described when it counts the most.

Tiffany will be presenting the *Implementation of Information Management Tools in DNA Casework Workshop* at ISHI this November. This workshop will introduce practical tools for practitioners to implement information management procedures using the Linear Sequential Unmasking-Expanded approach. The workshop will begin with a background presentation on key concepts in human factors and the importance of information management in forensic casework. The introduction is followed by group activities on the general human factors concepts. Once the general concepts have been covered, presenters will cover concepts specific to linear sequential unmasking and linear sequential unmasking-expanded and other impact mitigation techniques for cognitive bias in forensics. A practical tool for implementation of LSU/LSU-E will be provided and the participants will be divided into groups. Each group will work through examples using the worksheet to classify different types of information/communications which could be encountered in casework. The groups will practice documenting and categorizing information based on biasing potential, subjectivity, and task relevance. Participants are encouraged to bring examples of communications or information received in their past casework or communication logs from closed cases to practice with the worksheet. Following the practical exercises, there will be a discussion to compare and contrast how the participants classified each piece of information and and time for any questions that may have come up.

To learn more, see page 11.



The Missing Piece

Stephanie Isaacson

A video collaboration between ISHI and Othram featuring the multi-disciplinary teams behind the cases

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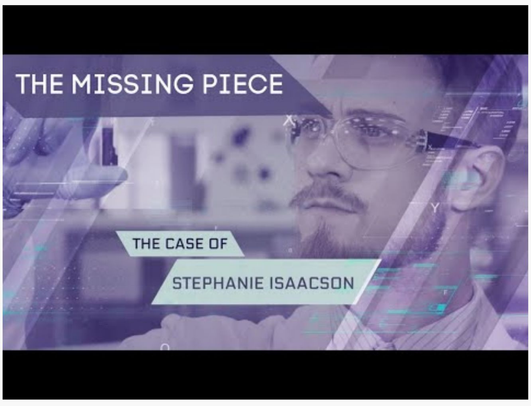
For years, victims were listed on cold case files in law enforcement evidence boxes. While never forgotten, limitations in forensic science prevented their cases from being closed. Families waited decades for answers and justice while their killers remained unidentified.

In 2018, a new tool for crime solving rose to prominence as the notorious Golden State Killer was finally unmasked; forensic genetic genealogy. To begin, investigators upload their unknown DNA profile to the site, which generates a list of the closest genetic matches, based on how many centimorgans (cM) of DNA are shared with the unknown person. Next, investigators will begin to build back the unknown person's family tree until a common ancestor is uncovered. Then, they will build the family trees forward, identifying every descendent possible, using traditional genealogy techniques. Once the trees have been fully built out, investigators look to identify candidate persons that might match the unknown person. Once a person of interest has been identified, new DNA can be collected to compare to the original forensic sample.



Advanced DNA testing has revealed Darren Roy Marchand as the suspected perpetrator in the brutal murder of 14-year-old Stephanie Isaacson from Las Vegas.

In June 1989, 14-year-old Stephanie Isaacson headed out on her morning walk to Eldorado High School. The Las Vegas teenager frequently took a shortcut through a vacant sandlot off Steward Avenue and Linn Lane to get to school quicker. After school let out that afternoon, Stephanie's father began to worry when she did not arrive home at her usual time. Upon calling the school in hopes of finding out where she may be, it was revealed that Stephanie never made it to school.

A missing person report was filed and law enforcement investigators then conducted a local search, canvassing the area around the typical route that Stephanie would take to school. Her body was found at a sandlot and investigators determined she had been sexually assaulted and strangled to death. A lengthy investigation, spanning decades, ensued and all available investigative leads were exhausted. Stephanie's killer remained undiscovered.

In 2021, the Las Vegas Metropolitan Police Department teamed up with Othram to reexamine DNA evidence from the crime scene in hopes that advanced DNA testing might generate new leads in the investigation. Funding assistance was generously provided by Justin Woo, founder of the non-profit organization Vegas Helps.

Othram scientists used Forensic-Grade Genome Sequencing® to build a genealogical profile from the remaining DNA evidence — only 120 picograms (or 0.12 nanograms) of DNA. This sets a new lower limit on the quantity of DNA required to build a genealogical profile for a suspect of a crime.

The Othram genealogy team used the profile to develop investigative leads that were returned to LVMPD. Detectives were able to confirm the identity of the suspect in Stephanie's sexual assault and murder as Darren Roy Marchand. The suspect died in 1995 by suicide but has been tied to other crimes.

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ISHI 33 Workshops Announced

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Pre and post-conference workshops have been announced for the 33rd International Symposium on Human Identification. Topics covered include probabilistic genotyping, forensic genetic genealogy, leadership, NGS/MPS for the sexual assault backlog, and more. ***Select workshops will be available to live-stream virtually.***

Registration is limited, so claim your spot early!

Shortened descriptions, dates, and costs are included below. For more information on any of the workshops, including speakers, visit our website.

Sunday, October 30

8:30am - 5:00pm

Sherlock in Your Homes: Solve a Crime with IGG Workshop

This interactive workshop instructs attendees on how to use crime scene evidence, investigative leads, and DNA profiles to solve a simulated crime using Investigative Genetic Genealogy (IGG). A cross-disciplinary panel of IGG experts and law enforcement personnel will share a GEDmatch profile to work hands-on with attendees as they walk through various stages of the IGG investigation to identify the "perpetrator" of the crime. Attendees should have some knowledge of genetic genealogy and the basics of genealogical research. Attendees must bring a laptop and have at least an Ancestry free trial subscription to fully benefit from this hands-on IGG experience.

Cost

Early Registration - $245

Standard Registration - $295

9:00am - 12:00pm

AABB Meeting

This workshop will address AABB accreditation topics, including the accreditation process, Relationship Testing Standards, proficiency testing, validations, and calculations.

Cost

There is no charge for this workshop, but pre-registration is requested.

1:00 - 4:00pm

Mixture Interpretation Workshop

To have a better understanding of mixture interpretation and deconvolution by providing a lecture with validation samples.

We will discuss the procedure on how to best use the data incorporating the usage of peak height ratio, imbalance, stutter, etc.

Attendees will be provided with validation samples to be used under their own standard operating procedures followed by how those same samples are interpreted at the Houston Forensic Science Center Lab using our standard operating procedures.

This workshop will be presented entirely in Spanish.

Cost

$75 for in-person or virtual registration

Monday, October 31

8:30am - 5:00pm

Applying a Casework Assessment and Interpretation Approach to Probabilistic Genotyping Results

This workshop will give the audience an introduction to casework assessment and interpretation (CAI) approaches for reviewing the outputs (including the likelihood ratio) and diagnostics of probabilistic genotyping software used for the analysis of forensic DNA mixtures. CAI methodology is a formal model for the evaluation of evidence in a balanced, logical, robust and transparent manner.

We will describe the various diagnostics and outputs from such software and give guidance on the assessment of results by way of examples. We will explore issues such as the number of contributors, relatives, and stochastic effects within a mixture. Handouts will be provided.

Cost

Early Registration - $245

Standard Registration - $295

Virtual Registration - $125

8:30am - 5:00pm

The New Superior – A Better Way to Be the One in Charge

It's difficult working as a scientist in a law enforcement agency. Laboratory leaders find themselves pinched between the needs of their scientific personnel and the expectations of their police commanders. In this workshop, our facilitators will challenge what it means to be a superior and encourage participants to develop new attitudes and strategies for being more effective and trustworthy in how they lead and manage their people. Participants will undergo a Gallup Global Strengths assessment and learn how their individual strengths create both advantages and disadvantages in how they interact with a wide variety of people, including scientists, criminal justice professionals, and police commanders. Through expanded self-self awareness, our attendees will grow their effectiveness as leaders working in the complex arena where science meets the arbiters and enforcers of law.

Cost

Early Registration - $245

Standard Registration - $295

8:30am - 5:00pm

Investigative Genetic Genealogy: A Comprehensive Review

Investigative Genetic Genealogy is powering cold case solves on a daily basis around the country. The purpose of this workshop is to provide a comprehensive overview of the process of investigative genetic genealogy from lab to investigation. This will entail a deep dive into the instrumentation used (microarray, next gen sequencing, whole genome sequencing), bioinformatics used to transform that data, the databases utilized and the process of investigation that genetic genealogists use. The forensic community is new to this process and this workshop is intended to provide clarity to the community.

Cost

Early Registration - $245

Standard Registration - $295

Virtual Registration - $125

Thursday, November 3

1:00 - 4:00pm

Using Next-Generation Sequencing (NGS) to Improve Sexual Assault Investigations

Sexual assault kits make up the majority of operational casework for many laboratories in the United States. Next-generation sequencing offers enhanced technical and analytical capabilities that can aid in processing these kits effectively. This workshop explores how NGS can obtain more information, provide more investigative leads and thus reduce the backlog. A panel of experts will discuss (1) the strengths and limitations of CE and NGS, (2) the value of Y-STRs and SNPs for short and long range familial searches, (3) options for STR and SNP mixture deconvolution, and (4) data interpretation and validation studies to enable seamless implement NGS for sexual assault resolution.

Cost

Early Registration - $200

Standard Registration - $220

Virtual Registration - $125

1:00 - 4:00pm

Implementation of Information Management Tools in DNA Casework

This workshop will introduce practical tools for practitioners to implement information management procedures using the Linear Sequential Unmasking-Expanded approach. The workshop will begin with a background presentation on key concepts in human factors and the importance of information management in forensic casework. The introduction is followed by group activities on the general human factors concepts. Once the general concepts have been covered, presenters will cover concepts specific to linear sequential unmasking and linear sequential unmasking-expanded and other impact mitigation techniques for cognitive bias in forensics. A practical tool for implementation of LSU/LSU-E will be provided and the participants will be divided into groups. Each group will work through examples using the worksheet to classify different types of information/communications which could be encountered in casework. The groups will practice documenting and categorizing information based on biasing potential, subjectivity, and task relevance. Participants are encouraged to bring examples of communications or information received in their past casework or communication logs from closed cases to practice with the worksheet. Following the practical exercises, there will be a discussion to compare and contrast how the participants classified each piece of information and and time for any questions that may have come up.

Cost

Early Registration - $200

Standard Registration - $220

Virtual Registration - $125

1:00 - 4:00pm

Technical Leaders Meeting

Description to be announced.

Cost

Early Registration - $200

Standard Registration - $220

1:00 - 4:00pm

Grupo Cientifico Latino-Americano de Trabajo Sobre Identificacion Humana

Description to be announced. This workshop will be presented entirely in Spanish.

Cost

Standard Registration - $100

Virtual Registration - $100



Are you a student pursuing a degree in forensic science?

Are you passionate about sharing your research with future generations?

Can you "hashtag this" quicker than you can pipette?

Would you like to win free registration for ISHI 33 at the Gaylord National Harbor near Washington D.C.?

If so, we invite you to apply to become an ISHI Student Ambassador.



CONNECTION

As a student, you know that it's important to network with those in the field who can further your research or assist you in obtaining a job after you graduate. But networking can be intimidating! As an ISHI Student Ambassador, you'll make connections before you even arrive in Washington D.C. We will showcase you and your research on our website and social channels, introducing you to other attendees and jumpstarting the networking process.

Is there an expert in the field that you'd love to meet? Let us introduce you!

You'll also have access to all networking functions, including the Welcome Event and Wednesday Night Event.

Haley Fallang
Towson University

"By far and away ISHI was the best meeting I've attended. Everyone was friendly and willing to answer questions about their professional experiences, the speakers were outstanding, and the location couldn't have been better."



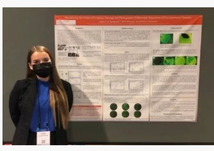
OPPORTUNITY

As an ISHI Student Ambassador, you'll attend the largest conference focused entirely on DNA forensics. Learn about the latest techniques and technologies over two and a half days in the general sessions. You'll also be granted complimentary registration to the pre and post-conference workshops, which will provide you with information that you can take back to the lab with you.

Is the stress of looking for a job after you graduate wearing on you? Each year, ISHI hosts a large number of vendors in our exhibit hall. You'll have access to the exhibition area to chat with potential employers and being an ambassador will look great on your resume!

Amber Vandepoele
Syracuse University

"My favorite part of the conference was stopping by all the vendor booths. I learned about many new technologies both in and outside of my discipline and had great conversations with many companies. When looking into some companies and products further, I found many webinars and resources that I am using to continue learning outside of the classroom. "



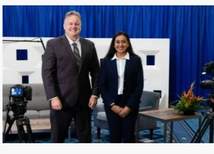
INSPIRATION

You're never too young to make a difference! As an ISHI Student Ambassador, you'll have a chance to share your passion for forensic DNA with your peers and future generations. Present your scientific poster to an in-person audience, including mentors you'll be able to take selfies with later.

We'll also record a video interview of your poster presentation to be shared on our social channels later, leading to further connections.

Nidhi Sheth
Rutgers University

"I was fortunate to have been selected as an ISHI student ambassador. This gave me a great opportunity to present and talk about research. I also got the opportunity to interview Mark Desire, Assistant Director at Chief Medical Examiner's Office. To sit and chat with him about his experience in the field was an invaluable experience. Special Thanks to the ISHI Organizing committee."



THE NEXT STEPS

Interested in applying? Here's what you need to do.

Draft a written essay answering the following questions using between 500 to 750 words total.

- Forensic science can be a demanding career. The work may be exacting and tedious without a lot of recognition for a job well done. How did you decide that forensic science was the career for you? What aspirations do you have for your career after graduation and what is your scientific area of focus?
- If you are selected to attend this year's ISHI, what do you hope to gain from your participation? What impact might participation in ISHI have on your personal and career growth?
- If you are awarded free conference registration, you will be asked to present a scientific poster. Briefly describe what your scientific poster will be about.

Prepare a video recording between 30 seconds and 2 minutes long.

The video should explain why you would like to participate in this year's conference. It can elaborate on any aspects of the conference that especially appeal to you (i.e., meeting a certain speaker, attending a specific workshop, participation in networking events, etc.). Don't be afraid to let your personality show through. The committee is looking for candidates who can communicate their excitement for forensic science to fellow students.

Four winners will be selected by a group of reviewers from the ISHI Committee. Selected students will receive waived registration for ISHI 33 and any additional workshops held at ISHI (* Travel and hotel accommodations are the responsibility of the student.)

Olivia McCarter
University of South Alabama

"I have never been to another conference, but if the rest of them are like ISHI, then I'm excited to go to more!"



The students awarded free registration will be asked to provide the ISHI committee with (but not limited to) the following materials to be shared on social media by ISHI show management:

- A headshot or photo of the student.
- A day in the life series to be shared on our Instagram stories.
- A 500-word blog post before the ISHI symposium about what the student's plans are for the meeting.
- Photos to be shared on the student's social media channels of you preparing for the conference.
- A scientific poster presentation at ISHI (abstract due July 24, 2022).
- Social media posts each day of the ISHI conference.
- Onsite interviews at the symposium with the ISHI media team including (but not limited to) sharing of the student's scientific poster, and what they hope to learn/have learned while in attendance.
- A handful of photos taken at the event.
- A 500-word blog post after ISHI about what the student learned at the meeting.



ELIGIBILITY REQUIREMENTS & CONTEST RULES

- This contest is open to students currently enrolled in a forensic science (or a similarly named program) at the undergraduate or graduate levels.
- Applicant must have a public Facebook and Instagram page to allow for sharing of content.
- All videos and essays must be submitted by the submission deadline of April 17, 2022.
- All submissions must be original and not previously published elsewhere.
- By submitting an entry and video clip to the contest, each entrant gives ISHI all rights, including copyright, to the entry and express permission to edit and publish the entry in all media listed above without limitation and without any other notice.

ALL APPLICATIONS MUST BE RECEIVED BY APRIL 17, 2022

Learn More and Apply

Sign Up to Receive Future Issues In Your Inbox

Deadlines

February 2022

ISHI Registration Now Open

June 19, 2022

Oral Abstracts Due

June 19, 2022

Interesting Case Abstracts Due

July 24, 2022

Poster Abstracts due

July 31, 2022

Early Registration Deadline

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Country

I consent to adding my name to the ISHI mailing list

Submit

Do you like what you see in ISHI Magazine?

Your customers do too. Consider advertising in an upcoming issue and reach a targeted forensic audience of more than 5,000 people (US and international combined)

Contact Tara Luther to inquire about rates and specifications. Space is strictly limited.

tara.luther@promega.com



Deedra Hughes

Deedra Hughes is the Assistant Director and CODIS Administrator of the Mississippi Forensics Laboratory. She earned her Bachelor of Science in Biology from Alcorn State University and her Masters in Forensics Science from National University San Diego. Deedra is employed with the Mississippi Forensics Laboratory since 2000 where she oversees the technical aspects of the four laboratories in the state and oversees the state's DNA Database. She has assisted in authoring the DNA arrestee collection law for the state of Mississippi, and trained Sexual Assault Nurse Examiners throughout Mississippi on the proper collection of sexual assault evidence. Deedra is a member of the Scientific Working Group of DNA Analysis and Methods (SWGDAM). She serves as the Co-Chair of the CODIS committee on SWGDAM, and is a trained ISO 17025 and QAS auditor. She serves on the Forensic Advisory Board for the University of Mississippi. Deedra is a member of the American Society of Crime Laboratory Directors, American Academy of Forensic Sciences, Southern Association of Forensic Science and Mississippi Division of the International Association for Identification. She also holds a national certification from American Board of Criminalistics.



Ronaldo Carneiro da Silva Junior

Ronaldo is a Forensic Expert at Technical Scientific Directory of Brazilian Federal Police. He is the Custodian of the National DNA Database and Coordinator of the Steering Committee of the Brazilian Network of DNA Databases.

Ronaldo obtained his Pharmacy degree at the Universidade Federal Fluminense - in habilitation in Industrial Pharmacy and Biochemistry. His Master (2005) and Doctorate (2009) degrees were completed at the Universidade Federal Fluminense.

Ronaldo has been the head of the Technical-Scientific Sector at Federal Police Superintendence in the State of Acre from 2012 to 2014 and Head of the Forensic Genetics Area at the National Institute of Criminalistics from 2016 to 2018.

He is a member of the International Society for Forensic Genetics (ISFG) and was an elected member of the Board of Directors of the Ibero-American Working Group on DNA Analysis of the Ibero-American Academy of Criminalistics and Forensic Studies (GITAD/AICEF) for the 2017/2019, 2019/2021, and 2021/2023 biennia.

Ronaldo is a collaborator of the National Secretariat of Public Security (SENASP) within the Collection of Biological Material in Brazilian Prisons Program. He is also a project reviewer of the Federal District Research Support Foundation - FAP/DF. He is a founder and member of the management team of the DNA Integrated System (SInDNA) Development Project, a tool that has the proposal to be a complete solution for the development of forensic genetics and for the promotion of DNA Databases in Brazil.



Dr. Nicole Novroski

Dr. Nicole Novroski is a Forensic Geneticist and Tenure-Stream Assistant Professor at the University of Toronto in the Department of Anthropology with a primary teaching appointment in the Forensic Science Program at the University of Toronto Mississauga (UTM).

Dr. Novroski's academic accolades include a Bachelor of Science (Hons; 2009) in Forensic Science and Biology from the University of Toronto, a Master of Science (2011) in Forensic Biology from the University at Albany (SUNY) and a Doctor of Philosophy (2018) in Molecular Genetics from the University of North Texas Health Science Center at Fort Worth, Texas. Her educational training largely focused on the exploration of previously uncharacterized genetic markers for improved DNA mixture de-convolution of complex forensic profiles. Dr. Novroski is the recipient of numerous honors including the Forensic Sciences Foundation (AAFS) Douglas M. Lucas Grant, the Connaught New Researcher Award and the University of Toronto Mississauga Dean's Award for Excellence (Faculty). She is an Associate Member of the American Academy of Forensic Sciences, an Active Member of the International Society of Forensic Genetics and an Active Member of the Scientific Research Honour Society Sigma Xi. Her publication record includes over 20 peer-reviewed manuscripts, 35 scientific communications, public abstracts and oral presentations as well as two book chapters. She is an ad hoc reviewer for multiple international journals in the areas of human and forensic genetics and serves as a committee member for LabRoots Forensic Science, the Swiss National Science Foundation, and the American Society of Human Genetics DNA Day Essay Contest.



Brian Kim

Brian Kim is a Criminalist for the Los Angeles Police Department. He completed his Bachelor of Science degree in Biochemistry at the University of California Los Angeles. Brian joined LAPD in 2011 and was assigned to the Serology DNA Unit which processes over 20,000 DNA samples a year. He is currently a member of the validation team which evaluates and implements new technology to assist in forensic DNA analysis.



Dr. Claire Glynn

Dr. Glynn previously worked as a forensic scientist at Eurofins Forensic Services (formerly named LGC Forensics) in Oxfordshire, England. Eurofins Forensic Services is one of the United Kingdom's leading forensic science providers for the UK's police forces. Dr. Glynn worked in the forensic biology department, within the homicide and sexual assaults team, which has investigated some of the UK's most high-profile crimes.

For her Doctoral degree, Dr. Glynn chose to pursue cancer research, specifically breast cancer, as she wanted her research to be truly impactful, translational, and patient-oriented. The research team that Dr. Glynn worked with is world-renowned in the field of breast cancer research. Her research focused on developing novel biomarkers (microRNAs) for disease diagnosis and treatment. The molecular profiling skills she learned throughout her Ph.D. research are now being researched and applied to forensic applications for the identification of forensically relevant body fluids.

Dr. Glynn, who joined the University of New Haven in 2014, teaches both undergraduate and graduate courses in forensic science, focused on forensic biology, forensic DNA analysis, and forensic/investigative genetic genealogy (F/IGG). Her research interests are focused F/IGG, and a broad range of applications for this novel investigatory tool. This includes investigating the effects of degraded samples and novel technologies, establishing best practices, the international feasibility of this tool, historical applications, and ethical considerations, to name just a few. Her other research interests include Rapid DNA analysis, RNA (mRNA and miRNA) analysis, Single Nucleotide Polymorphism (SNPs) applications, and DNA Methylation markers.

Dr. Glynn is the founding Director of the University of New Haven's online Graduate Certificate in Forensic Genetic Genealogy, and she actively consults and provides subject matter expertise on the topic to law enforcement agencies, both nationally and internationally.



Brian Hoey

Brian Hoey is a twenty-nine-year veteran of the Missouri State Highway Patrol Crime Laboratory. Brian worked much of his career as a DNA analyst and served as the DNA technical Leader for 8 years. Brian is currently the Director of the laboratory system.

Brian holds a Bachelors and Masters degree in Biology from Northern Illinois University. as well as an MBA from William Woods University.

Brian served as a Member of the Scientific Working Group on DNA Analysis Methods (SWGDAM) for 8 years as well as served on it's on the Executive Board for 3 years. Brian is a Member of the Midwestern Association of Forensic Scientists (MAFS) where he served on the Board of Directors as the Treasurer for three years (2008-2011) and President (2013). Brian was awarded MAFS Outstanding Scientist in 2016. Brian has given talks and taught workshops for MAFS, Promega, ASCLD, Bode to name a few. Brian is a certified facilitator for Police Leadership: The West Point Model. Brian is on the Forensic Laboratory Needs Technical Working Group and is also a member of the American Academy of Forensic Sciences (AAFS) and The American Society of Crime Laboratory Directors (ASCLD).

Brian has been married to his wife Kristen for 21 years and together they have two daughters Kate 20 and Kyra 17.

DNA Solutions from Spent Shell Casings and Rootless Hairs

Bode X-traction technology enables DNA recovery from spent shell casings and rootless hairs. Advanced sampling methods developed from the ATF[8] combined with technology developed at Bode enable analysts to obtain **~10 X more DNA from spent shell casings** and obtain useable nuclear **DNA profiles from a single hair**.