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ISHI INTERNATIONAL SYMPOSIUM ON HUMAN IDENTIFICATION

SAN ANTONIO, TX | SEPT. 14–17, 2020

August 2020

The ISHI Report

News from the World of DNA Forensics

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ISHI for Good



The ISHI Report

Letter from the Editor

Greetings from Promega! We hope this edition of the ISHI Report finds you and your loved ones safe and healthy. The ISHI organization team has spent the last few months learning more then we ever thought about hosting a symposium in a virtual environment. We trust the result will be an event that will inform you about the latest scientific advances in forensic science while providing an opportunity to network with others who share your passion.

The general session program will be split into three half day sessions running from Monday, September 14 through Wednesday, September 16. Topics will include policy updates like the latest guidelines from the FBI on use of Rapid DNA and a report from OSAC on new standards for forensic DNA testing laboratories. You'll also hear updates on the GEDmatch database and several examples of cold cases solved using forensic genetic genealogy, including the oldest Doe case ever resolved with the technique. In all, more than twenty speakers will share their research in the general session.

If you're interested in a deep dive into using probabilistic genotyping in court, implementation of Rapid DNA, or learning how forensic genealogy is being used to solve cold cases consider registering for one of the workshops being offered in conjunction with ISHI. Find all the details and register on www.ishinews.com, the official symposium website.

As the COVID pandemic wears on, we could all use a distraction. It's our hope that this latest ISHI Report will provide you with a welcome diversion as it explores current topics in forensic science and introduces forensic professionals who are influential in the field.

In this issue we interview Lutz Roewer, who has been instrumental in the foundation and continued success of the YHRD database. He'll give updates on the current status of the YHRD and share how agencies can benefit by using its data.

We talk to Susan Walsh, currently a professor at Indiana University–Purdue University Indianapolis about her cutting-edge research in forensic DNA phenotyping. She'll be speaking at ISHI on advances in predicting eye color.

Sylvain Hubac of the French Gendarmerie shares an update on adopting the mobile DNA lab used for processing DNA samples from mass disasters to assist in COVID testing. His agency is one of many helping community efforts to combat the pandemic.

Two guest authors describe new tools for forensic genealogy both to train individuals in the methodologies and incorporate new techniques to solve cold cases. Taking a step back in history, we learn from Rachel Keiser about testing skeletal remains from the house of Aragon.

Finally, if you plan to participate in ISHI 31 we've got some tips to help you make the most of your experience. Enjoy the August issue. As always, we welcome your ideas and written contributions to our publication. We hope to see you virtually at 31st International Symposium on Human Identification which launches on September 14.

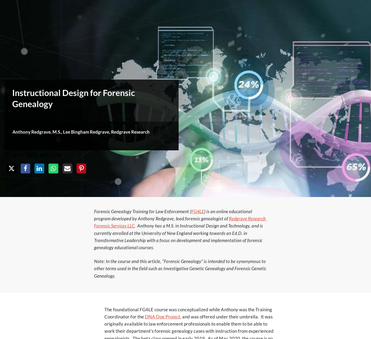
Stay well,

The Editorial Board

Contact ISHI

Travis and Vegas the Bull Discuss ISHI 31





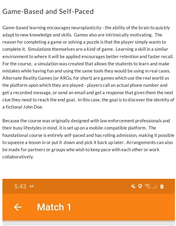
Instructional Design for Forensic Genealogy

Anthony Redgrave, M.S., Lee Bingham Redgrave, Redgrave Research

Forensic Genealogy Training for Law Enforcement (FGALE) is an online educational program developed by Anthony Redgrave, lead forensic genealogist of Redgrave Research: Forensic Services LLC. Anthony has a M.S. in Instructional Design and Technology, and is currently enrolled at the University of New England working towards an Ed.D. in Transformative Leadership with a focus on development and implementation of forensic genealogy educational courses.

Note: In the course and this article, "Forensic Genealogy" is intended to be synonymous to other terms used in the field such as Investigative Genetic Genealogy and Forensic Genetic Genealogy.

The foundational FGALE course was conceptualized while Anthony was the Training Coordinator for the DNA Doe Project, and was offered under their umbrella. It was originally available to law enforcement professionals to enable them to be able to work their department's forensic genealogy cases with instruction from experienced genealogists. The beta class opened in early 2019. As of May 2020, the course is no longer affiliated with the DNA Doe Project, and has been expanded into an online school open to a wider variety of professionals and students.



FGALE login screen

Assessment and Development

The primary target audience in 2018 was law enforcement professionals, so a survey was created for potential students. It was not created to find out what the students already knew or didn't know, but rather to gain insight into any trends in their learning styles and preferences. What was discovered was interesting. Most of the respondents said they did not like to play games, but when given a free response area to discuss what they do when they're not working, many of them described activities that could be described as games, such as sports and puzzles. When asked their favorite part of their job, they all expressed caring about the lives of people that they help and being interested in their different stories.

Game-Based and Self-Paced

Game-based learning encourages neuroplasticity - the ability of the brain to quickly adapt to new knowledge and skills. Games also are intrinsically motivating. The reason for completing a game or solving a puzzle is that the player simply wants to complete it. Simulations themselves are a kind of game. Learning a skill in a similar environment to where it will be applied encourages better retention and faster recall. For the course, a simulation was created that allows the students to learn and make mistakes while having fun and using the same tools they would be using in real cases. Alternate Reality Games (or ARGs, for short) are games which use the real world as the platform upon which they are played - players cast an actual phone number and get a recorded message, or send an email and get a response that gives them the next clue they need to reach the end goal. In this case, the goal is to discover the identity of a fictional John Doe.

Because the course was originally designed with law enforcement professionals and their busy lifestyles in mind, it is set up on a mobile-compatible platform. The foundational course is entirely self-paced and has rolling admission, making it possible to squeeze a lesson in or put it down and pick it back up later. Arrangements can also be made for partners or groups who wish to keep pace with each other or work collaboratively.



Screenshot of a lesson on mobile platform

Topics covered in the lesson modules include:

- DNA Basics
- Simulated adoptee case
- Commonly-used websites and services
- Tree building and management
- Preparing DNA evidence for genealogy
- Advanced DNA: segmentology
- Research and best practices
- John Doe case simulation



"Glowstick Doe" fictionalized John Doe image

Who Was Glowstick Doe?

After learning the foundations of forensic genealogy, FGALE students are assigned the task of identifying "Glowstick Doe," so named for the still-illuminated glowsticks he was wearing when he was discovered within hours of his death. Students are given choices such as how to "upload" their DNA kit, or choosing to email DNA testers and witness a wide spectrum of responses based on real experiences of working forensic genealogists. When the case is "solved," students submit a sample report showing how they came to their candidate for identification. Completion of the course issues a numbered certificate that agencies can validate.

Example certificate

Continued Learning

Students who have completed the foundational course have further options if they choose to continue. Law Enforcement professionals have the option to bring a case from their department and participate in a case launch which allows them individual hands-on guidance to set up their case for the best chance of success. They will have the ability to participate in the beginning stages of casework along with experienced forensic genealogists who can help them feel comfortable taking the case forward on their own or with their department.

Case Triage

The purpose of case triage is twofold: It gives departments an opportunity to have their forensic genealogy case continue to be worked on for as long as may be necessary, and gives student interns hands-on experience with cases which would otherwise be shelved. There are innumerable cold cases with DNA evidence. Of the small number of cases that are submitted for forensic genealogy, the odds of a case being an "easy" ID are not at all predictable until the DNA kit is uploaded and evaluated. Many forensic genealogy cases may end up stalling out or languishing due to difficulties related to the age or ethnicity of the target individual, or a limited budget or available hours for the case to be worked. Departments may have genealogists inform them that the case is not workable. Most forensic genealogy cases with sufficient DNA for analysis are likely solvable (given enough time, resources, and genetically related testers), and students need real cases to work on to prove their skills and learn to creatively innovate to solve any number of puzzles that might arise during forensic genealogy research. Departments who have these kinds of cases can submit them for "triage" directly to FGALE, where students can reevaluate the case, organize any previous research associated, and continue to work with fresh eyes while under the directions of an experienced lead forensic genealogist.

Internship

FGALE graduates can apply for an advanced student internship. These interns are selected from a variety of fields and experience levels to ensure that each cohort is a well balanced team. Cases that have been submitted for triage are worked by student interns over a period of 12 to 18 months to gain practical experience and build a portfolio of work. Interns will also occasionally get to work faster-moving cases from start to finish, or adoption cases that are more difficult, to have the experience of seeing different kinds of case work. They also assist with development of educational materials and help run elective student clubs and projects, such as the Trans Doe Task Force.

A screen capture of the Redgraves chatting about genealogy with Senior Interns Olivia McCarter and Tanner Preston Soulsby during Trans Doe Task Force Virtual Pride livestream event.

Working Together Toward a Common Goal

Forensic Genealogy is a collaborative process, and FGALE students come from many different backgrounds with strong skills in related fields. We encourage cooperation between these adjacent and often-overlapping fields to achieve the highest possible rate of case closure.

Traditional and genetic genealogists, adoption search angels, and surname/Y project organizers bring their genealogical research skills to the table and a mastery of the use of genetic genealogical databases and comparisons. Genealogists contribute their research experience and understanding of segmentology in exchange for guidance on such things as handling sensitive case information and working with degraded or contaminated data that can affect genealogy work in sometimes unusual ways.

Anthropologists and Anthropology students have been a tremendous asset on a number of forensic genealogy cases. Anthropologists can advise on age, ethnicity, and sex estimates, and are an excellent resource to draw on if a team member has a question about skeletal remains. They can also often have insights on admixtures to discuss with genealogists.

Law enforcement professionals who choose to can be the internship instead of or in addition to a case launch provide a unique perspective on cases. Detectives have different research methods from genealogists and when combined, research can be exponentially successful. Several former students who are law enforcement professionals have gone on to solve cases within their own departments, and have even been asked to form and lead forensic genealogy units.

Other fields that successful forensic genealogy students have come from include education, criminal justice, lab science, data analysis, medicine, death care, psychology, private investigation, and computer programming, to name only a few. FGALE has trained individuals on five continents and we are working on translating the course into Spanish and Dutch, and hopefully more languages. We are also expanding our class offerings to include micro-learning and mini classes for supplemental learning, including an upcoming class for teens and homeschoolers.

While not every person who sets out to learn forensic genealogy will end up making it their career, individuals in adjacent fields need to stay up to date on the latest techniques making a clear educational path necessary. Forensic genealogy training can help members of the public as well as law enforcement become more comfortable with this relatively new profession and field of study.

Forensic Scientist of Note

Dr. Lutz Roewer

Interview conducted by Nicole Siffling, Promega



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Dr. Lutz Roewer is one of the renowned forensic scientists who transformed DNA forensics through studying the Y-chromosome and demonstrating the value of Y-STR analysis for forensic casework. The use of a YSTR profile can help by excluding male suspects, or indicating multiple male contributors, or provide information that can be used to help find an unknown male perpetrator. Additionally, YSTR analysis is done for kinship testing and cases such as missing persons or for identification of victims in mass disasters.

Dr. Roewer is currently an Associate Professor for Forensic Genetics at the Institute of Legal Medicine in the Charité, Berlin (Germany), and Director of the Department of Forensic Genetics at this institute.

He is also the curator of the Y-Chromosome Haplotype Reference Database, also known as the YHRD and is working in various European-funded international projects, like DNASEQEX. Additionally, Lutz is a member of the editorial board of Forensic Science International Genetics and of the advisory board of the International Journal of Legal Medicine.

Dr. Roewer has been a member of the SWGDAM Y-STR Committee for the past 5 years, and last but not least, he has authored more than 130 peer-reviewed articles in scientific journals and publishes regular reviews and chapters in various textbooks.

This September, Dr. Roewer will be presenting at the 31st International Symposium on Human Identification on the YHRD database. Recently, Nicole Siffling, Meeting and Marketing Communications Manager at Promega spoke with him to learn more about the database and future applications of the Y-Chromosome



So Lutz, you told me just recently that the DNA Commission of the ISFG has published the recommendation on the interpretation of YSTR results in forensic analysis, which actually resumes 25 years of YSTR research. What can you tell me about this great paper?

Yeah, the paper appeared just a week ago in a journal called the Forensic Science International Genetics, and it is the final stage of, as you say, 20-25 years of research and collaboration all over the world with crime labs and research departments. They have provided information on YSTRs' allelic spectrum, information content and so on, in order to solve sexual assault cases.

For courts and for experts, it's very important to make a correct interpretation of such data. With the final edition of these guidelines, I think we could give a lot of advice and help to those court-going experts from now on (and may I make this point) especially in different jurisdictions. So in different countries in the world. We found solutions based on the context of the jurisdiction of a country, so that a tailor-made solution can be found and interpretation can be done the right way.

Wow, this sounds like a wonderful tool now for the experts.

Now, I would like to come back to the YHRD database. It was launched in 1999 and now hosts more than 307,000 haplotypes from 1,348 sampling locations. Lutz received samples from more than 450 institutes from 135 countries worldwide, which is, I think, amazing. And, on top of that, when the US YSTR database was discontinued, the data was permanently transferred to the YHRD, which makes this YHRD database even more global and great.

So, can you tell me anything new about this database? Is there anything exciting lately?

What's exciting is that every day we receive data requests and questions on giving advice to regional stakeholders and experts; how to use a confidence interval which they can find in the YHRD, how to find a frequency that they find in the YHRD, and so on. So, this is the most exciting – to have this permanent communication with the community via this database platform.

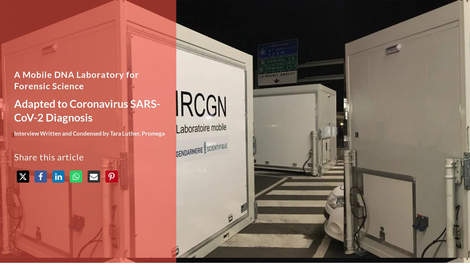
Apart from this, I wanted to mention that the last 2 weeks we've received data from the Republic of Kiribati, which is a small republic in the Polynesian archipelago and from Northern Africa (Burkina Faso), so it shows that not only the big countries, but also the small countries are interested. So, the Forensic Police in the Burkina Faso is interested to use this resource for their local crime finding. It's amazing that important countries like the US, China, Singapore, and Germany focus on this database as their preferred resource for reference material. So, they've coined their guidelines in a way that that YHRD is the advised reference material. And when you see the differences of these countries, and you see the successes of the approach, we are very happy with that.

This is really a great tool and I think you can be proud that you are (I say) the father of this database.

Generally speaking about YSTRs in forensics, do you see anything new that scientists will practice in the near future?

The Y-Chromosome is a multi-purpose tool. You can resolve mixtures. You can match male suspects to traces, and so on. This is well known for decades. However, it is also well known that it is very important or very useful to trace back in time the lineage of a person. So you can get some information on a person's ancestry, because it's very nicely embedded in the Y-Chromosome structure or the mutation profile where this person geographically, and ethnically, and linguistically comes from. So you can even trace the language of a person (which you'd never know) only from a hair using the Y-Chromosome; where the ancestors of this person probably lived and which languages they speak and so on. So, that could be, of course, a big help to crime labs and police in severe cases where clues aren't available for an unknown suspect. You can get more background context out of a trace, which is crucial for the case.

This is very important work you're doing. Thank you so much for this interesting highlight of the YHRD, and I have to say, you're one of those forensic scientists who transformed his knowledge of the Y-Chromosome into something very valuable and useful for the forensic community. So, thanks a lot and all the best.



A Mobile DNA Laboratory for Forensic Science

Adapted to Coronavirus SARS-CoV-2 Diagnosis

Interview Written and Condensed by Tara Luther, Promega

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When we last interviewed Sylvain Hubac he explained how the mobile DNA lab he helped design for the French Gendarmerie (IRCGN) has been used to facilitate DNA identification in various settings. What exactly is the mobile DNA Lab and why is it more useful than employing standard practices for processing DNA?

Hubac and colleagues envisioned creating a lab on wheels stocked with the specialized equipment needed to quickly process DNA samples. Some areas of the country lack the specialized equipment and reagents that are necessary to process DNA samples in an expedited timeframe. The lab that Hubac conceived would be able to travel to remote locations where modern forensic laboratory facilities might not be available. Once on location, the scientists deployed with the lab could collect the required samples and process evidence on site.



Outside view of the MobilˈDNA unit



Transporting the MobilˈDNA unit to a worksite

Several issues needed to be considered when designing the mobile lab. Crime labs are specially designed to separate pre and post amplification processes. Care must be taken to avoid contamination between the two environments. Reagents and samples need to be stored under refrigeration and the equipment needs a power supply. Therefore, the lab would also need to have a self-contained power supply that could generate sufficient current and operate for extended periods of time. After a great investment of time and money, the first mobile lab was ready to be deployed.

Shortly after the first mobile lab was finished, it was subjected to its first big test. A terrorist attacked a group of celebrants on Bastille Day in Nice, France. More than 80 people were killed in the attack when a lunatic driving a truck purposely drove at high speed through a crowd celebrating the holiday. Many of the victims were tourists on holiday. Speedy identification of the bodies was essential to allow families to be notified and the remains returned.

Within hours of the terrorist attack, the mobile lab was on its way to the scene. Within the span of only a few days all the victims were identified demonstrating the efficiency of bringing a forensic lab directly to the crime scene.

Recently Sylvain and colleagues wondered if the MobilˈDNA unit could serve another purpose. With the COVID-19 pandemic raging, they suggested deploying the lab to assist in processing samples from the potentially infected. To date the MobilˈDNA unit has assisted with more than 12,000 COVID samples.

We caught up with Sylvain and asked him about the IRCGN deployment of their mobile DNA unit to assist with testing in the pandemic.

Hello Sylvain, it's good to speak to you.

Can you describe some of the challenges you had to overcome to repurpose the mobile unit to process COVID samples instead of standard DNA samples?

We had to overcome two major challenges:

- Time, because we have validated the workflow in only few days following ISO 15189 and ISO 17025 procedures
- Training more than 40 technicians in order to ensure the capability to process samples 7 days on 7 during 3 months

I assume that special precautions needed to be taken to ensure that samples were safely collected. Who was tasked with collecting the samples and what steps were taken to ensure the safety of personnel?

The samples are collected by nurses or medical doctors specially trained for nasopharyngeal collection using a swab.

When you work with forensic samples for DNA analysis, you need to use very strict SOP processes to prevent contamination of samples. So we just applied this same rigorous process for COVID samples. We also work under a microbiological safety cabinet to protect the operator from the samples and the virus. For this step, the technicians wear full suits, gloves, safety glasses and FFP2 mask.



Pre-PCR Zone of the MobilˈDNA unit



PCR Zone of the MobilˈDNA unit

How quickly were results generated with the mobile lab? How many samples did you process?

The results of 96 samples were generated in less than 4 hours using an automated process involving only 5 technicians. We processed more than 12,000 samples with a maximum capability of 1,000 samples per day.

The MobilˈDNA lab of the French gendarmerie was adapted as a true extension of the fixed hospital laboratory by validating the following analytical process in 5 steps:

1. Taking samples and recording into the LIMS of the MobilˈDNA lab for traceability on the basis of the unique barcode identifier. This LIMS is connected to the LIMS of the hospital unit in order to automatically transfer the results of the essays and provide the clinical microbiologist with a complete overview and control of analytical data.

2. Sampling a fraction of the biological sample to be analysed. This operation is carried out under a type 2 microbiological safety cabinet (MSC) requalified on the site. This operation is carried out from a 96-position DeepWell type plate, using an innovative samples positioning system (SPS) patented by the IRCGN in a modular version allowing its use under the MSC.

3. Extraction of the RNA contained in the sample by lysis of the virus using chemical agents (Viral prep Adem-kit®, Ademtech France) followed by magnetic beads purification using KingFisher Flex® Apex instrument (ThermoFisher) allowing 96 purification in 40 minutes.

4. Quantification of purified RNA by real-time PCR (RT-PCR) system. The RT-PCR is performed in 80 minutes with the GeneFirst RUO COVID-19 Detection Kit (CE-IVD pending) validated by the French National Reference Center for respiratory viruses, Pasteur Institute. The protocol is performed according to the recommendation of the manufacturer. The reverse transcription reagents for the RNA virus are done in one shot in the sample with the same reagents. This kit allows detection of two specific targets of COVID-19 (NGene and ORF 1 ab) and one internal control human target (GAPDH) (19).

5. Results interpretation and generation of reports. This operation is carried out using an in house software GendLink® adapted to the occasion to generate a report on the results of COVID analyses.

What were the benefits of deploying the mobile lab versus requiring patients to travel to a health facility? What are other scenarios where a mobile lab would help with rapid DNA analysis?

The MobilˈDNA lab and the forensic science laboratory of the French gendarmerie in the context of the COVID-19 pandemic provided three short-term solutions with a direct impact on this crisis situation:

1. The possibility of setting up an additional testing capacity within a short time to deal with a massive influx of individuals to be tested on a hospital site. This makes it possible to limit the bottlenecks in hospital services in the event of urgent results being needed during the phases of the rise of the pandemic, and, at the time of deconfinement, by moving autonomous test capacities in a planned manner. The laboratory is 100% autonomous and capable of handling the process from the sample to the rendering of results. This allows for separation between those who have tested positive for the virus and those who remain negative, to avoid a second wave of infection. Indeed, we will never have this type of information through serology, which only indicates it if a patient has been in contact with the virus, but not if he is infectious or not.

2. Respond to a demand for test capacity in rural areas or overseas, for citizens distant from the test centres, or even in the absence of these. This will limit mass movements to test centres and provide an immediate solution. Once validated, the concept will be very easily transposable for other situations, and will be deployed in record time anywhere in France and overseas.

3. Validate and propose a global and efficient concept of a mobile lab unit for rapid molecular diagnostic tests that is easily transposable and deployable anywhere in the world during such a scenario. This combines the expertise of interior security force with high throughput Forensic DNA capabilities and expertise of clinical microbiology structure in the diagnosis of endemic pathogens.

The others scenarios where a mobile lab would help with rapid DNA analysis are cross border control or a massive DVI context where the shortest time to identify the victims is crucial for the family and the logistic for managing humans remains from the crime scene to the regular laboratory is very restrictive.



Sylvain Hubac

Sylvain Hubac, Ph.D. received his doctorate in molecular biology and genetics from the University of Paris Seine. He joined the Forensic Science Laboratory of the French Gendarmerie in 2004 as military officer. Sylvain is the head of the High Throughput DNA unit for reference and DVI samples in which more than 120 000 analyzes are carried out per year. He's DNA expert since 2007 and develops also solutions for improve efficiency and speed up of DNA analysis. Sylvain was particularly involved in DNA identification of the 150 victims' remains of the Germanwings flight that crashed in the French Alps in March 2015 and more recently in DNA identification of the 86 victims killed in Nice in 2016 by a terrorist attack during the evening of the Bastille Day.

An Update from the Organization of Scientific Area Committees (OSAC) for Forensic Science

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Biology/DNA Standards and Best Practices Webinar Series

On July 15 the Organization of Scientific Area Committees (OSAC) for Forensic Science, the American Academy of Forensic Sciences (AAFS) Academy Standards Board (ASB) and Promega held the first webinar in a series aimed at providing information on new standards and best practice recommendations for forensic biology and DNA testing laboratories.

Part one of this series, ***Development and Publication of New Standards and Best Practices – The Process***, described the complete process for standards development within OSAC and the ASB.

OSAC's program manager John Paul Jones II kicked off this webinar with an overview of OSAC and its history, the general process of document creation and construction within OSAC, and a description of the OSAC Registry process.

Next, Robyn Ragsdale, chair of OSAC's Biology/DNA Scientific Area Committee (SAC) and member of the ASB DNA Consensus Body, presented information about this SAC and its subcommittees and the history and processes of the creation of DNA documents within OSAC.

Teresa Ambrosius, ASB Secretariat, followed Robyn's presentation by giving an overview of the ASB and its history, the general process of document standards development within ASB and the DNA Consensus Body, the publication of the final documents by ANSI/ASB, along with information regarding the future process of maintaining or revising the documents.

The second webinar in the series, ***Mixture Interpretation, Validation, and Protocol Development and Verification***, was held August 5 and focused on two published standards that pertain to the interpretation and comparison of DNA profiles, with an emphasis on DNA mixture interpretation.

Charlotte Word, a member of OSAC's Biological Data Interpretation & Reporting Subcommittee and the ASB DNA Consensus Body presented the requirements in these two interrelated standards, ANSI/ASB Standard 020, *Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol*, First Edition, 2018 and ANSI/ASB Standard 040, *Standard for Forensic DNA Interpretation and Comparison Protocols*, First Edition, 2019.

Joanna Johnson then shared information regarding how the Indiana State Police Laboratory system implemented these two standards in its laboratories.

The webinar series will continue September 9 with ***Training Standards Overview***. During this webinar Kim Murga, former chair of OSAC's Biological Methods Subcommittee and member of the ASB DNA Consensus Body, and Beth Ordeman, chair of OSAC's Biological Data Interpretation and Reporting Subcommittee will discuss several standards that have been written to address various areas of training in serology and DNA testing.

If you were unable to attend parts 1 and 2 of this webinar series, you can view them on-demand on the Promega website. Registration for part 3 is still open – learn more here. You can also catch Charlotte's presentation on new standards for forensic DNA testing laboratories during her session at the upcoming ISHI Symposium on September 15.

For more information on OSAC, please visit our website at https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science.

If you are interested in applying to join OSAC, please see https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science/apply-join-osac.



Tips for Attendees

Making the Most of a Virtual Conference

Tara Luther and Alison Suchon, Promega

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2020 has been a year of changes for all of us. We've learned how to keep in touch while socially distancing. We've learned how to work from home with furry co-workers who encourage us to break from the traditional 9-5 routine. We've learned how to make changes to our labs to stay safe and productive.

For many of us, this will also be the first time that we attend a virtual conference. While it's easy to focus on what we'll be missing by not gathering together, there are advantages to moving to the virtual space. By making the most out of your virtual experience, you'll be able to walk away with valuable insights, a robust network, and valuable information that you can use in your own lab.

To help, we've put together a list of tips that will help you maximize your experience at ISHI this year.

Keep an Open Mind

Whether consciously or unconsciously, you may be thinking that you will not learn as much from an online conference as you would in person. This can be especially true given the interruptions that COVID-19 has already caused to our daily life. ISHI may look a little different this year, but we have taken care to plan an agenda that will provide you with actionable takeaways that you can use in your lab. Going in with an open mind will strengthen your motivation and willingness to participate.

Organize Your Session Schedule

This year, you're in charge of your own agenda! While sessions will be pre-scheduled to allow for Q&A with the speakers, they will all be available on-demand after. Taking a close look at the conference agenda beforehand will allow you to prioritize which sessions you want to watch first.

Whether you missed a session or were hoping to go back and spend more time on a session, you have all the control with an online conference. All sessions will be available on demand for at least 30 days after the conference, so you can take your time viewing them. Pause as needed to take notes. Reach out to a speaker as you're watching for clarification. Take advantage of participating in a conference that fits into your schedule.

Set Time Aside for Learning

It's easy to assume that you'll have time for online learning, but time always manages to slip away throughout the workday. Set some time aside before the conference begins or block your calendar so that you'll be able to focus on watching the sessions. You can even set reminders for sessions that you want to be sure to watch live.

Minimize Distractions

Whether you're working from home, the office, or the lab, distractions are bound to pop up. Limit them by setting up a quiet space where you can participate in the conference. Silence your phone, block your calendar, and consider putting a "do not disturb" message on your email.

If you're logging on from home, try to find a quiet space where you won't be interrupted by your furry, four-legged "co-workers" or children won't come bounding into the room like you're being interviewed on the BBC. But don't worry about dressing up. Go ahead and wear those pajama pants and fluffy slippers.



Familiarize Yourself With the Tools

Don't wait until the day of the conference to test out the platform on your device. Test your audio and ensure a strong WIFI connection. Laptops or desktop computers work better than viewing on a smartphone, though the platform is compatible with mobile devices.

Make Sure You're Receiving the Latest Communication from ISHI

We will be sharing updates on ISHI 31 via email and social media. Make sure that your email address is accurate in your registration and that you've added Cvent and ISHI to your address books. Consider following ISHI on Facebook, LinkedIn, and Twitter to keep up with the latest.

Print Out Workshop and Session Materials Ahead of Time

If you're the type of person who likes to take notes during sessions, make sure you print out and organize the presentation slides before the conference begins so that you're ready. General Sessions slides will be available to download from our website.

Be an Active Participant

It can be tempting to slip in and out of sessions without participating during a live event and remaining anonymous is even easier online. Resist that temptation! What you get out of the conference depends on what you put in. Introduce yourself in the chat and see what new connections you can make. Is there a topic that you're interested in discussing? Start a conversation! Do you have a question for the speakers? Don't be afraid to connect with them.

You never know how the connections you make today will benefit you tomorrow. It's also a good way to feel closer and more connected to the presenters and other attendees, even if you're far apart and have a computer screen in front of you.

Join a Virtual Community

Participate on our social media channels like our Facebook page or LinkedIn Group. Use the hashtag #ISHI31 on Twitter and Instagram.

Involve Your Peers

Just like in-person events, it can be more comforting to navigate a virtual conference with someone you know. Whether you're in the same room or not, having a peer to discuss the sessions with can help with comprehension, allow you to compare key takeaways, and will increase your attention span.

Schedule 1:1 Sessions with a Specialist

One of the best things about attending an in-person conference is visiting the exhibit hall to learn more about all the latest technologies and products in one place. Meeting with vendors is not limited to in-person events, however. You have the ability to schedule 1:1 meetings with all of our vendors without ever leaving the platform. You can choose a time that fits into your schedule and stay up to date without leaving your office.

Take Breaks

At in-person events, you typically move room to room to different sessions, can check out the snack bar, and are talking with new people as you roam. You'll want to make sure you do that during the virtual ISHI, too. Get up, walk around, stretch, and get some brain-boosting treats to keep yourself alert.

Most Importantly, Don't Forget to Have Fun!

In addition to all that is listed above, we've planned a virtual ISHI game where you can compete with your colleagues for a chance to win registration to ISHI 32 next year. We'll also be asking you to get creative and submit photos each day for a chance to win other prizes. Keep an eye on your inbox as more details will be coming soon!

To learn more about this year's program and reserve your spot, visit our website:

Learn More



Advertorial

Unprecedented Demand During a Global Pandemic:

How Partnerships Within the Forensic Community are Making Communities Safer During Uncertain Times

Andrew Singer, Vice President, Global Marketing and Operations Sales, Bode Technology

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DNA has been the driving force in developing investigative information in all types of crimes across the country. New techniques such as forensic genealogy coupled with the legislatively driven sexual assault kit testing requirements are challenging the forensic community to meet these increased testing needs while maintaining high quality standards. Fortunately, the forensic laboratory community thrives in challenging situations.

Forensic DNA laboratories are seeing an increase in demand for testing which is presenting many challenges, most of which they have never before faced. Most will agree that 2020 has exacerbated these challenges and created unpredictable strains on our ability to operate. The global pandemic we are currently facing, which has impacted the ability of many of us to work safely and has required rapid adaptation to minimize the risk of spreading infection. Bode Technology and other crime laboratories have found new ways to work within our organization, and together, to ensure we are meeting the public safety demands to our law enforcement and community partners.

The Demand for DNA Testing

DNA analysis remains a critical element in many criminal investigations and technology is evolving quickly, driving the demand for testing. Rapid DNA instruments, for example, enable law enforcement and attorneys to have fast and hands-on access to DNA. To further fuel the demand, federal funding and public awareness of forensic genealogy resulting in high-profile DNA match successes are enabling investigators to utilized DNA to solve cases that were previously thought of as unsolvable.

Newly enacted sexual assault kit testing legislation is driving more cases to the labs, often with mandatory turnaround times. This legislation is often doubling or tripling the submission rates of these kits to laboratories. The impact of managing both a backlog and an influx of new cases can strain laboratory operations.

According to the End the Backlog website, more than 100,000 sexual assault kits have been identified either in backlogs or unsubmitted by law enforcement. Additionally:

- 29 states, including DC, have sexual assault kit audit laws
- 34 states, including DC, have mandatory testing for new kits
- 9 states require the testing of old kits
- 25 have tracking laws, including DC
- 24 have victim right to know the status of their kit

While these legislative improvements are taking steps to creating safer communities, they are also increasing the demand and strain on public/ state laboratories. This has led to an increase in outsourcing to private laboratories like Bode and further strengthened partnerships between the public and private sectors.

Driving Workflows and Improving Processes

Faced with the unprecedented demand for the testing of current cases, combined with the visibility of the testing status resulting from requirements for tracking and victims'-right-to-know legislation, it is critical to identify ways to meet the demand on testing while maintaining a high level of quality. Sometimes, out-of-the-box thinking is necessary.

Traditionally, the approach for the DNA analysis of sexual assault kits has been to perform manual slide searches for spermatozoa. While this provides valuable information for investigators and attorneys regarding the source of the biological material, it can be a bottle neck in the laboratory. This has been one of the drivers for implementing male DNA screening (Y-screening, Y-marker screening, etc.) in sexual assault cases.

At Bode, we initiated a Y-screening approach while supporting one of our clients in clearing their backlog in the mid-2000s. Through the elimination of the burden of manual searching, we were able to quickly increase capacity and reduce costs. Unfortunately, this shifted the bottleneck and provided strains on DNA analysis and technical review. To address this, Bode has focused on implementing automation, along with extractions utilizing DNase, an enzyme that breaks down DNA, to help create cleaner profiles. These procedures have saved thousands of hours of analyst time annually, where we are now reporting approximately 15,000 kits per year.

The focus on developing these technologies has enabled partnerships with laboratories across the country that are faced with the burden of managing a backlog and an increase in cases. Some have recognized that the spike in testing best managed by partnering with a private laboratory. In doing so, cases will be reported sooner and the impact of reducing the backlog will be felt by those involved much more quickly when compared to the cost and process of hiring and training internally. The forensic community is a close one, and the partnerships and relationships we have developed to accomplish our goals will continue to have a positive impact on public safety.

Why Are We Testing

The importance of testing sexual assault kits cannot be understated. Sexual assault is a very violent and personal crime. Statistics have shown that 8 out of 10 perpetrators of sexual assault know their victim[1]. Additionally, many suspects in these cases have significant criminal histories[2]. Most of us got into forensics to help solve crime, but if we can use science to identify perpetrators before they commit a subsequent crime, the impact to our community is that much more significant.

Beyond the personal impact our work has on victims, a recent study demonstrates the significant economic impact of the use of DNA in investigations[3]. Research shows that testing backlogged rape kits produces a positive return on investment (ROI) of up to 65,000% to society.

In addition to the positive support of the community on clearing backlogs, the economic impact of preventing crimes is significant as well. Researchers have estimated that testing every rape kit could save states more than $400,000 per averted assault. As more kits are tested, more serial offenders are identified which, assumedly, prevents future sexual assaults.

Over the past several years, the increase in legislation has often been balanced with increased investments from the federal government to create programs that will clear and prevent backlogs. These programs will help prevent future crimes, protect the would-be victims and have a positive economic impact to the communities.

The Emergence of New Technologies

Forensic genealogy has taken the industry by storm since the very public, and high-profile, identification of James DeAngelo as the suspect in the Golden State Killer case. Since then, forensic genealogy has been instrumental in developing investigative leads in cold-case homicides and rapes, as well as identifying unknown remains across the country. Almost every case is highlighted in the media and it is conceivable that this technology will become more mainstream in the future.

Through Bode's forensic genealogy program, we have thoroughly documented the use of both microarray single nucleotide polymorphism (SNP) and whole genome sequencing (WGS) technologies to generate genetic profiles that can be searched against public entries in genetic databases such as Family Tree DNA (FTDNA) and GEDmatch. Bode strives to protect the confidentiality of both the investigation and the genetic witnesses identified in the databases throughout the course of the investigation while simultaneously enforcing strict protocols and training for our analysts and genealogists in order to ensure all evidence, documentation and communication is being handled properly.

For crime laboratories, it is likely that as these technologies are brought in-house, there is far more to consider than just sending out samples to be tested. It also adds additional burden to already maxed out laboratories to perform research, develop protocols and policies and train staff on communicating with law enforcement. As we collectively manage the rise in demand, the key to success likely lies within the continued collaboration of our communities.

The Pandemic Tipping Point

Considering everything that we are dealing with, it is easy to see that there is very little time to stop and observe the significant impact that forensic DNA laboratories, analysts and technicians, are having on our communities.

The global pandemic, which has impacted the ability of many of us to work in a safe environment and has required rapid adaptation to minimize the risk of spreading infection. In order to determine a way to continue to provide quality results while protecting the health of our scientists, the forensic industry has done what we have always done, adapted.

CLEAR Cases Initiative and Testing Cases ASAP

As we continue our mission in making the world a safer place, Bode has recently introduced our CLEAR Cases Initiative. The CLEAR Cases Initiative is more than just a clever acronym for Current Law Enforcement Analysis Requests. Traditionally, Bode's work has been focused on backlogged or unsubmitted cases. The CLEAR Cases Initiative eases the increasing burden of the current caseload on our clients and reduces turnaround times of current cases. The program creates a customized approach to priority casework and enables our clients to respond to their communities by developing investigative leads quickly in the violent crimes that are making the biggest impact on public safety.

The CLEAR cases initiative is available to laboratories managing their current casework demand, or potentially putting in contingency plans in the event they are impacted by the pandemic, or whatever else 2020 may throw at us.

In addition to the CLEAR Cases Initiative, Bode continues to offer our Accelerated Sexual Assault kit Processing service – Bode ASAP. Through this program, Bode works with clients to receive sexual assault kits on a weekly basis and report results in as fast as two weeks in-order to meet legislative and investigative needs. This program is focused on current casework and is already having an impact in helping solve cases across the country. Like the CLEAR Cases Initiative, this program enables our clients to have a solution, or a back-up solution, in place and ready to go if needed.

Unprecedented Times Call for New Solutions

At Bode, we have spent the past 25 years developing relationships within the forensic science community which have allowed us to meet our clients' needs for DNA testing, CODIS upload, and investigative support. This support has also enabled us to develop layers of back-ups and contingency plans.

We have seen the impact that domestic policy, advancing technologies, and global catastrophes can have on our livelihood. While we cannot predict the future, we can certainly consider where we are today and how we can best prepare for the future. At Bode, we are working to do this through strategic partnerships within our community and continuing to encourage communication through our networks. We invite all of you to work with us and to be a part of these solutions as we look ahead to unprecedented times. No lab, public or private, is immune to the impact of this virus, but we can do our best to prepare and respond to any challenge that we are faced with.

For more information visit https://www.bodetech.com/pages/clear-cases-priority-dna-testing-current-casework **or email** Bode.Service@Bodetech.com.

REFERENCES

[1] Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, National Crime Victimization Survey, 2010-2016 (2017).

[2] Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, Felony Defendants in Large Urban Counties, 2009 (2013).

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A DNA Testing Framework for Addressing the "Silent" Mass Disaster of Unidentified Remains and Unsolved Crimes

Michael Vogen, David Mittelman, PhD, Othram

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The search for answers began in 1994 when a fisherman discovered a body in the lake. The Snohomish County Medical Examiner's office determined the deceased to be between 25 and 35 years old and the victim of a violent homicide. There were multiple facial reconstructions for the victim, in part because ethnicity assessment was inconclusive. Each artistic rendition was shared with the public in hopes that someone would recognize the victim and come forward with information. After a quarter of a century, Lake Stickney John Doe's true identity remained unknown. No match in CODIS, no established ethnicity, and certainly no leads on who was behind this heinous crime.

There are hundreds of thousands of cold cases, like the case of the Lake Stickney John Doe, in the United States and the vast majority of them will not be solved using traditional forensic DNA testing frameworks. One such framework is the Combined DNA Index System (CODIS), an FBI program that supports DNA databases and infrastructure for using these databases to search unknown DNAs against a catalog of known felons. While CODIS will remain a critical and irreplaceable component of forensic DNA testing for the foreseeable future, countless solvable cases remain unsolved due to the simple fact that it was designed – from the start, when DNA testing was in its infancy – to identify those individuals who had already been identified by other methods. While effective in tracking repeat crime by convicted criminals, CODIS is largely ineffective for unidentified remains or recently imported criminals, as many of them are victims and not criminals. CODIS will not reveal the identification of all criminals, either. Many perpetrators of crimes have yet to have be caught and even those that are caught (and even convicted) may purposely or accidently be missing from CODIS.

Incredible advances in genetic testing have transformed what forensic professionals can learn from DNA left at crime scenes and a growing number of seemingly "unsolvable" cases are now being closed. These newer DNA testing methods rely on "reading" tens to hundreds of thousands of DNA markers across the genome. There was early (albeit limited) success in collecting genome-wide markers using SNP microarrays. However, while SNP microarrays (sometimes called SNP chips) power recreational DNA testing methods for ancestry and genealogy, they are not nearly as effective for degraded, contaminated, or mixed DNAs – the bread and butter of forensic DNA testing. Moreover, arrays provide little indication that they are failing as they fail, so even if a result is returned, it is difficult to assess confidence in the DNA markers that are measured. Inaccurate data can have catastrophic effects on downstream genealogy efforts and prevent otherwise straightforward paths to human identification.

The plot in **Figure 1** illustrates that even moderate DNA degradation has substantial impact on the performance of SNP chip call rates. In contrast, SNP call rates produced by Forensic-Grade Genome Sequencing® are insensitive to DNA degradation. Although not measured in the study summarized above, non-human contamination can have a substantial impact SNP chips as well. Bone extracts, for example, fail frequently on SNP chips, even at slight levels of degradation.

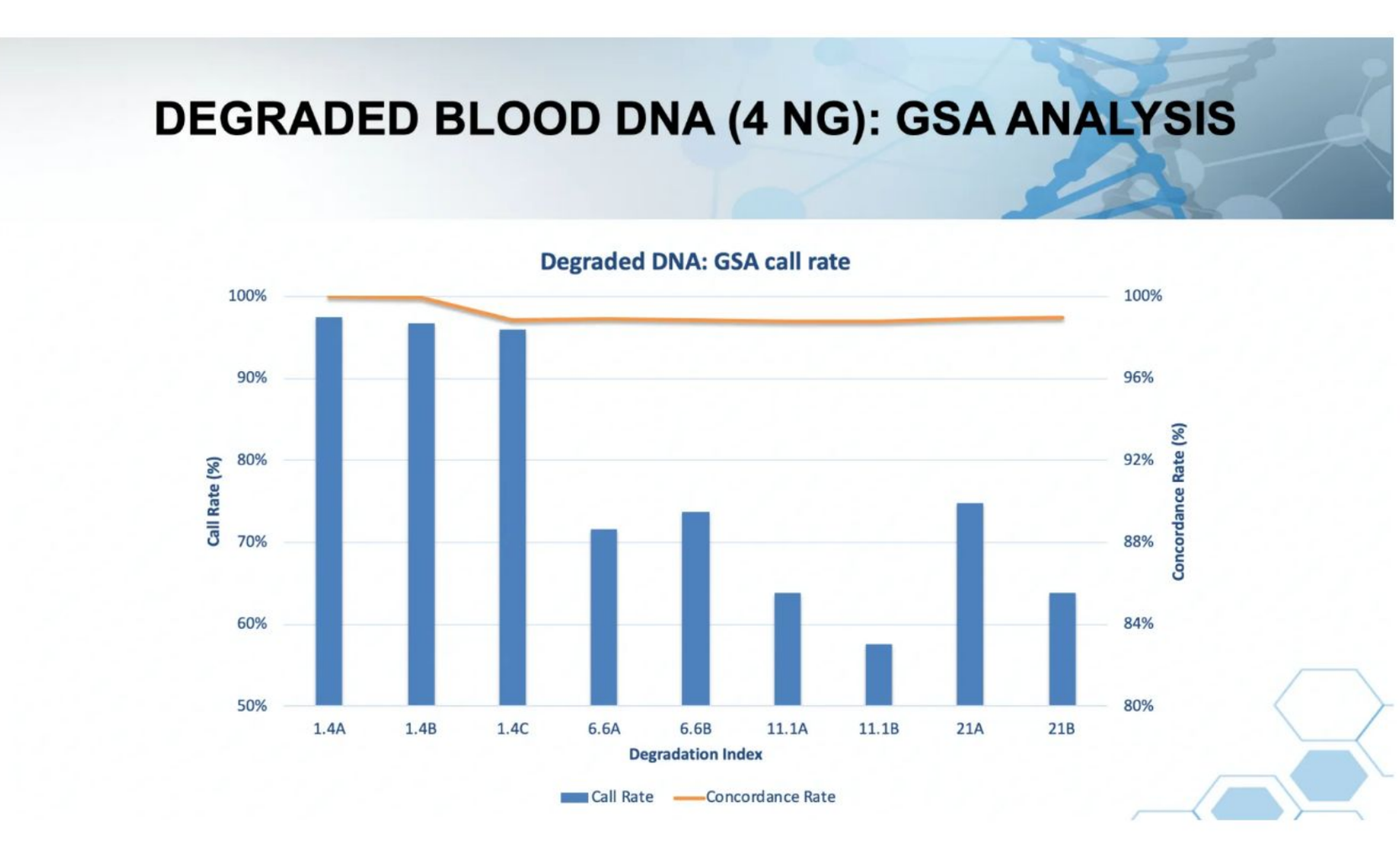


Figure 1. A 4 ng DNA extract from blood was degraded from degradation index (DI) 1.4 to 21. The DNA was analyzed using the Illumina Global Screening Array (GSA) SNP chip. Above results indicate that even with slight degradation, call rates dropped to as low as 58%. An identical study using Forensic-Grade Genome Sequencing® showed no reduction in call rate at any measured degradation level (data not shown). The study, data, and figure are provided courtesy of BODE Technology.

In addition to the above challenges, SNP chips require greater quantities of DNA than CODIS and other forensic methods. Coupling the increased quantity requirements with unpredictable failures for forensic evidence creates an alarming risk for fully consuming evidence without gaining the necessary information to establish a human identity. A key requirement for forensic DNA testing must be to extract the greatest number of informative markers while consuming the least amount of forensic evidence.

The better approach over SNP chips, especially for degraded and contaminated human remains, is to leverage massively parallel sequencing (MPS) techniques. Although more complex to utilize than SNP microarrays, MPS is more robust and accurate, and importantly, consumes less input DNA.



Figure 2. Massively parallel sequencing (MPS) techniques has transformed how forensic scientists access evidence. Pictured above is the Illumina Novaseq 6000, the highest throughput sequencer in the world. Othram Forensic-Grade Genome Sequencing® leverages this platform for maximum flexibility and scale.

As an example, Othram's Forensic-Grade Genome Sequencing® method is based on MPS. Our method combines MPS and advanced informatics to digitize genomes that otherwise fail with SNP chip and other non-sequencing methods. Genomic information is pieced together, leveraging multiple layers of quality data for every DNA position that is measured, to ensure accuracy.

A critical and under-appreciated advantage of massively parallel sequencing is the ability to detect novel genetic variations with exactly the same efficiency as previously seen variants. This can be used to minimize the types of error and bias intrinsic to microarrays and other methods, especially when working with imperfect forensic evidence. It is possible to combine sequence data (this cannot be done for SNP microarrays) so if insufficient data is generated from an initial test, results from multiple sequencing runs can be combined to produce an accurate representation of the DNA markers. The ability to iteratively and accurately collect DNA data from forensic evidence is critical for detecting distant genetic relationships and enabling human identification of an unknown person.

Case Study: Lake Stickney John Doe identified after 26 years

After nearly 26 years of working to identify the Lake Stickney John Doe, Snohomish County Sheriff's Office Major Crimes Unit, Cold Case Team and the Snohomish County Medical Examiner's Office positively identified the John Doe as Rodney Peter Johnson. Rodney was born in 1962 and his body was found in Lake Stickney in 1994. The Medical Examiner's office had determined that Rodney had suffered a gunshot wound to his head.



Figure 3. Homicide victim, Rodney Peter Johnson, pictured in 1979, spent 26 years unidentified until modern forensic sequencing techniques facilitated his identification. Investigators are now working to identify his killer.

For more than two decades, Rodney's remains went unidentified. Ultimately, successful identification of Rodney was established using Forensic-Grade Genome Sequencing®. Detective Jim Scharf and Snohomish County Medical Examiner Lead Investigator, Jane Jorgensen worked with a lab to extract the victim's DNA from a tooth, but the extracted DNA was heavily degraded and contaminated by non-human DNA. Less than 2% of the DNA was human. With just under a fifth of a nanogram of human DNA, the extract was sent to Othram for sequencing and genealogy.

Despite having about 20 cell's worth of badly degraded human DNA to work with, Forensic-Grade Genome Sequencing®, paired with a combination of proprietary enrichment methods enabled the reconstruction of a genealogical profile for the Lake Stickney John Doe. Detective Scharf and Investigator Jorgensen used this genetic reconstruction and good old-fashioned detective work to identify Rodney Peter Johnson.

After uploading the genealogical profile to a public genealogical database, a match was identified. Usually, one match is not enough to point to a single person. However, this match had included another clue in their public database profile. They belonged to a distinctive direct maternal lineage. The high-resolution genealogical profile allowed investigators to perfectly match up this uncommon maternal lineage signature. The investigators then found a record for a missing person that appeared to match Mr. Johnson. Interestingly, although the missing person was reported in 1996, Rodney had last been seen in 1987. He was only 25 years old. It's likely that after his murder, his body had been in the lake for as many as seven years before being discovered.

Investigators reached out to next-of-kin and used legacy DNA testing to confirm the identity established from the genealogical profile. With an identity now confirmed, investigators are now working to better understand what might have happened in the days leading up the Johnson's death. The homicide investigation would have been intractable.

Concluding Thoughts

Incredible advances in forensic science—like the ability to identify suspects through a family tree or obtaining a full DNA profile from a single strand of rootless hair or touch DNA used to be science fiction. Today, however, the tools available to forensic professionals are unprecedented. Scientists continue to push the limits of what sorts of DNA evidence can be probed for identifying information. New methods that can sort out mixtures of human genomes or enable the enrichment of human genomes from non-human contaminating DNA. Caution must be exercised in consuming evidence. Fully consuming evidence using an inappropriate or inadequate method can truly render a cold case unsolvable. As methods improve, we must invest in techniques that do not fully consume evidence and leave material for future testing and confirmations.

New methods need to be validated and benchmarked. The *ISHI* conference has historically been a fertile environment for discussing and critiquing new methods in forensic DNA testing. Although virtual this year, we are looking forward to continuing the tradition of scientific discourse in a virtual environment. Perhaps another telling sign that these new forensic methods are gaining traction is the launch of a new peer review journal, *Forensic Genomics*. The journal features associate editors from major stakeholders in academia and private forensic lab companies. Content will be organized into three complementary sections, one that deals with emerging technologies and inference tools, another that discusses examples of the practical impact of these technologies on current forensic casework, and a third that seeks to provide a path forward for expanded utilization of these technologies in current casework.

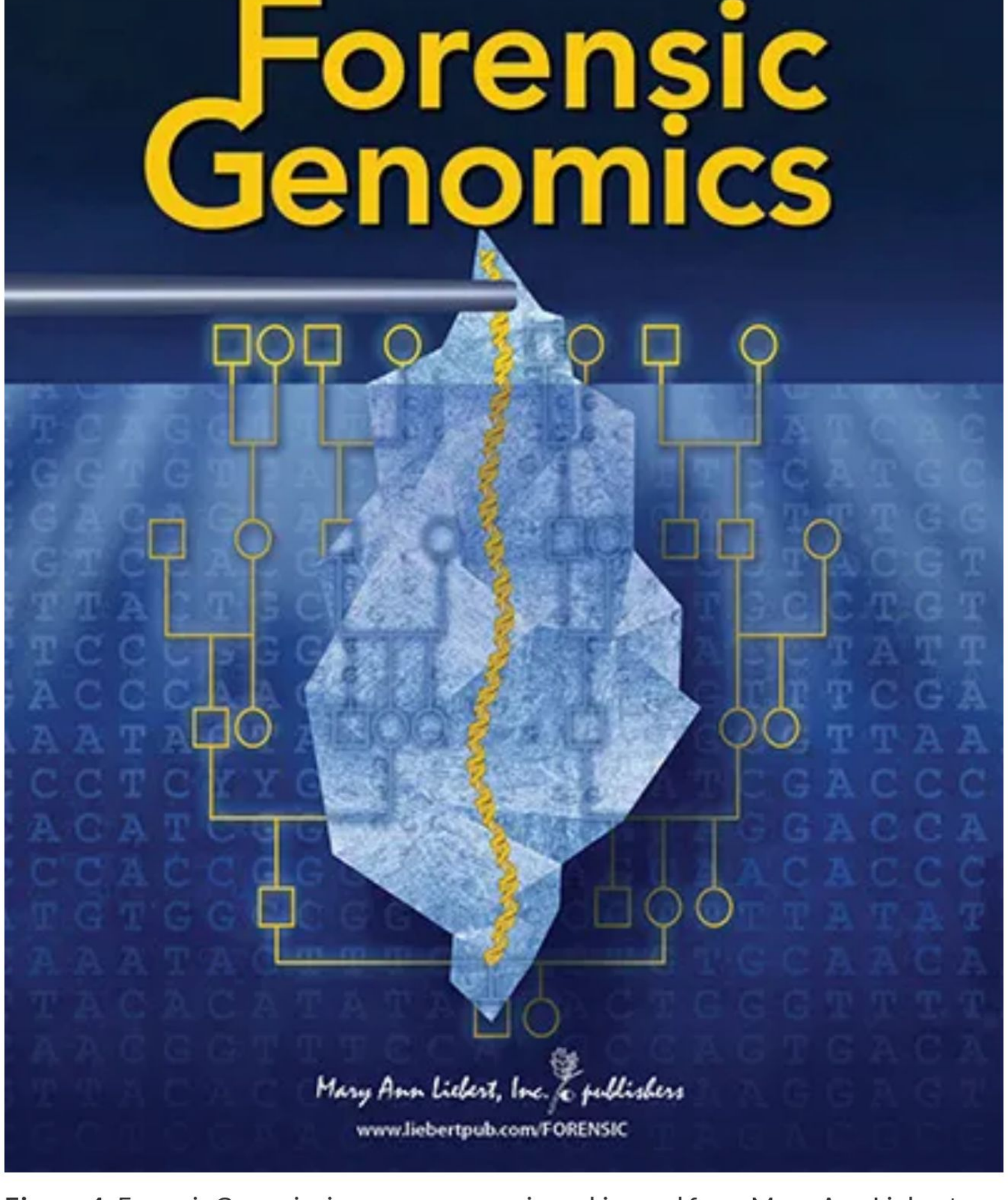


Figure 4. *Forensic Genomics* is a new peer-reviewed journal from Mary Ann Liebert, Inc. Launching officially in 2021, the journal will address how advances in genetic testing and genomic analysis can enable investigators to break through previously impenetrable forensic DNA barriers.








We Asked You to Rock Your ISHI Tee for a Good Cause and You Delivered!

In the May issue of The ISHI Report, we asked you to send in photos wearing your favorite ISHI tee to support Feeding America and Doctors Without Borders, and many of you did. Each time we downloaded one of those photos and read your words of encouragement it put a smile on our face, so we'd like to pass on the feeling.

Thank you for all that you do, and please continue to send in photos! We will miss sharing a cocktail and chatting with all of you in person this year, but look forward to connecting with you virtually.

Learn More and Submit Your Photo

Kimberly and Lorenzo Andreaggi

AFDIL

Stay strong and hope to see everyone soon at ISHI!





Rachel Kieser

Recent Ph.D. Graduate

Life is tough but so are you.

Rohaizah James

Promega

Keep on strumming, even if it drives your cat crazy.



Julie Sikorsky

Palm Beach County Sheriff's Office

Stay the course!





Amy Jeanguenat

Mindgen

It can be very overwhelming to focus on all the external problems. Focus local- like really local- focus on you! You can transform the world by transforming yourself. Don't ever forget the power of your ripple.

Jennifer, Colton, Lindsey, Brianna

Arkansas State Crime Lab

Brighter days will come!



Ixchel De La Luz

identidADN

Help a child: find out who is his/her biological father.





Nancy and Brian Peterson

Forensic Biology Consultants, LLC

I have been in the forensic biology business for the last 42 years. You have picked a great career helping to keep our communities safe. The career is not boring with all the changes occurring so frequently. Always remember that the individuals involved in any case look to us to help find the truth. That is the reward for a job carefully done.

Orlando Salas

General attorney of Nuevo León, Mexico

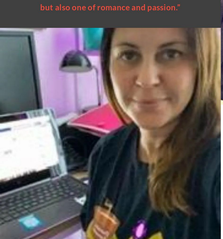
So happy to meet interesting people last year! So much to learn and with the will to do it.

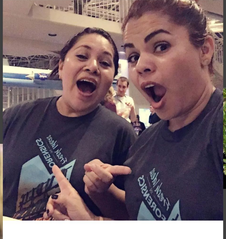


Fabiana Taglia

Florida International University

I'm not good with words but I quote this from Stephen Hawking because it represents me 100%: " Science is not only a disciple of reason but also one of romance and passion."





Carmen Castañeda and Gabriela Aguirre

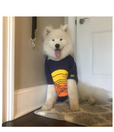
Perbiost México

This too shall pass! and soon we will be able to return to our normality.

DNA Labs International

We can't wait to see you all at the next ISHI!





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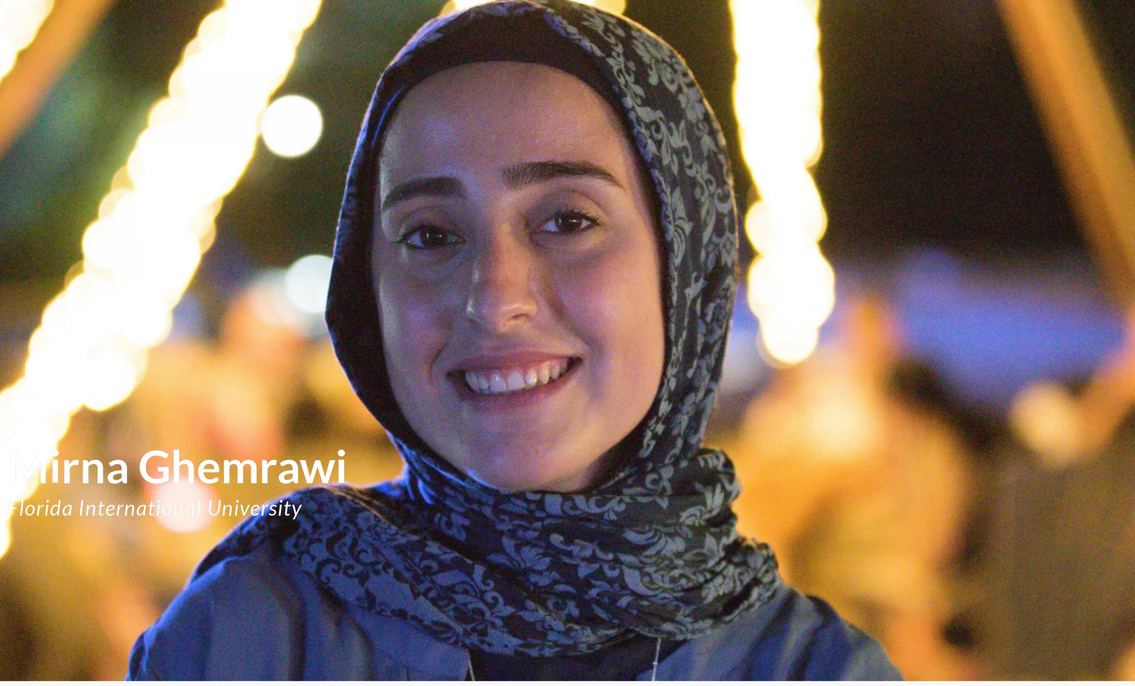

Mirna Ghemrawi

Florida International University

What were your first impressions of the conference?

Attending ISHI was always on my list. As a student, I had to work hard on my project so I can submit an abstract. Little did I know, I was honored not only to attend ISHI or to present at ISHI but also to be an ambassador as well. The moment I arrived to check-in, I knew that it will be once in a lifetime experience (that hopefully would be repeated every year). I was impressed by the organization of each and every details you can think of: time management, logistics, speakers, activities, interviews, exhibits, banners, theme, food, reception …

How does ISHI compare to other meetings that you've been to?

I have been to other conferences in the forensic field, but most of them include more than one concentration: forensic chemistry, biology, csi, impressions … What I liked the most about ISHI is that it focuses on forensic DNA which gave me a satisfaction in the knowledge I got in this area that is by itself huge. Yes, it is important to know about other fields in forensics but also it is very important to get an in-depth focus on your area of research, which I found at ISHI. I also liked the fact that you don't miss a talk because of parallel sessions as each slot has one speaker/panel going on at a time.

What was your favorite part of the conference?

My favorite part of the conference were the interviews I did. I got the chance to be part of #womeninstem as well as interviewing one of my favorite scientists, Dr. John Butler. This opportunity actually made me discover my love to combine science, mass media and communication.

Did you make any new connections with attendees that will assist in your research?

During my poster presentation, I met DNA analysts who were interested in my research. I was happy to discuss opportunities for collaborative studies with crime labs. It was through ISHI that I spoke to speakers in my area of research and had the chance to benefit from their knowledge.

What is one thing that you learned while at the conference?

It is hard to confine all my days at ISHI in just one thing that I learned as each moment was a learning experience by itself. But I would say that the main thing I learned is that as a student, I am on the right track as I loved each and every story I heard. I was thrilled to hear how throughout the years, forensic DNA has developed and that I was only 1 year old when CODIS was established.

What are your biggest takeaways?

My biggest takeaways are that there is no limit to how much we can learn or how much we can serve. Because each family/person deserves to have a closure, we have to constantly work on advancing this field. Last but not least, it is true that forensic science is exponentially growing but we can still make it better.

Do you have any advice for other students or attendees considering attending ISHI?

I highly recommend this conference to other students because I have no doubt that it will be beyond what is expected. Throughout the whole conference, I was on the edge of my seat listening to real caseworks. I was honored to meet experts from the federal, local and international crime labs as well as researchers from other institutions. As students and new scientists in the field, it is very important to explore and build connections. Who knows? Maybe you meet your future boss.



Rachel Kieser

University of North Texas Health Science Center

What were your first impressions of the conference?

I was excited to learn that ISHI 30 was to be hosted in Palm Springs. I had never experienced the California desert and I must say, it did NOT disappoint! The resort atmosphere was perfect to actively facilitate collaboration, networking, and the making of new friends within the field of forensic genetics.

How does ISHI compare to other meetings that you've been to?

Many conferences attempt to merge all things forensic into a short period of time, which often results in attendees missing presentations and opportunities. ISHI is an impressive, well-balanced conference where oral presenters, poster presentations, and exhibits are showcased in a way to best highlight the emerging technology and research within the field.

What was your favorite part of the conference?

My favorite aspect of ISHI is witnessing the progression of research, whether this is a student's thesis project where I get to learn more of what they have discovered year-to-year or something new and novel that it just beginning to move the field forward. Additionally, I enjoy seeing old friends (often with ISHI being the only time I get to see them each year), networking with local organizations or industry, and most certainly, being able to actively engage in scientific "think tanks."

Did you make any new connections with attendees that will assist in your research?

Absolutely! My research focuses on the development of novel methods for typing highly degraded DNA. Accompanying the use of these new molecular methods for challenged remains are numerous applications that have the potential to translate to various other areas within the field of forensic genetics. I greatly enjoyed actively talking with all attendees about my research and its impact across the field.

What is one thing that you learned while at the conference?

Although I had the opportunity to learn so much at this year's ISHI conference, one presentation that really stuck in my mind was the use of isotope analysis to develop a biological profile and determine the place of origin in missing persons cases. This form of investigation has the potential to provide a considerable amount of information in cases that are often limited or where there are no longer any investigative leads. Isotope analysis serves as a bridge to the past identifying an individual's region of birth (based on certain isotopes) as well as what environment that individual was around prior to their death. This research is fascinating and holds the ability to cross a variety of applications.

What are your biggest takeaways?

Currently, there is a considerable push toward using genetic genealogy to solve crimes. Prior to attending ISHI 30, I was unaware of the major policies coming into place concerning the use of databases for this approach to gaining investigative leads. I was pleasantly surprised by the community's proactive attitude to fund such actions and establish policies to protect the individual's genetic information and privacy.

Do you have any advice for other students or attendees considering attending ISHI?

If you are able to attend ISHI…GO! ISHI is the top conference to attend as a student or young investigator seeking a profession within the forensic genetics community as well as finding lifetime friends and collaborators. Additionally, the position of ISHI Ambassador offers students funding to attend the conference where they can experience networking and exposure to research.



Allison Sherier

University of North Texas Health Science Center

What were your first impressions of the conference?

Palm Springs was an absolutely gorgeous location for this year's ISHI conference and the theme stayed in line with all things Palm Springs. The set up for check-in was fantastic and the staff were absolutely amazing. The glimpse back into forensic genetics history was fun and I was in shock that there were materials from the O.J. Simpson trial out for people to handle. It was absolutely crazy to get to touch things from that case. I am so honored I was able to attend this year.

How does ISHI compare to other meetings that you've been to?

ISHI has a great mix of researchers and analysts. It's the perfect set up for me to learn about the current research going on in forensic genetics, but also talk to analysts about what they think about the research that I am doing. ISHI also has a great balance of time spent listening to speakers and time to network. I feel like most other conferences I have been to have a hard time balancing this. It is either too much and you get bored, or it is too little and you feel rushed. ISHI has a fun and relaxed vibe while also being a very informative conference.

What was your favorite part of the conference?

Networking and visiting with people I have met in previous years is my favorite part. We cannot move forward as an industry if we do not communicate and make friends with other people doing the same work. The forensic genetics community has a special dynamic, we will go farther and improve faster if we all work together and not compete with each other.

Did you make any new connections with attendees that will assist in your research?

My topic area being so narrow, sadly this year I did not meet anyone that was interested in collaborating, but I am sure as the area of human identification using the microbiome expands there will be more people to collaborate with in order to help improve MPS kits.

What is one thing that you learned while at the conference?

Only one thing?? Surely everyone who went to ISHI learned more than one thing. What I found the most interesting and exciting was the work that the DNA DOE Project is doing to help identify individuals using genetic genealogy. It is amazing how much good genetic genealogy has done for families that have missing loved ones.

What are your biggest takeaways?

The forensic genetics industry is changing and with that change, there is a lot to do in crime labs and in the court systems to make sure we are using the most informative genetic information available while also keeping people's personal information safe.

Do you have any advice for other students or attendees considering attending ISHI?

This is a great conference to attend to find Ph.D. and post-doctoral positions. The number of people from private, public, and research labs is fantastic for networking. If I had to pick only one meeting to attend each year, ISHI would definitely be my choice. There is just so much information and the people are so friendly to new people in the industry.



Fabiana Taglia

Florida International University

What were your first impressions of the conference?

The conference was mind-blowing, I am so grateful I had the chance to participate as student ambassador. I met so many researchers and even those experienced and in the field for many years showed excitement to be there. It was amazing.

How does ISHI compare to other meetings that you've been to?

This was my first conference therefore I cannot compare with others, but according to the program and talks offered form ISHI and other conferences, I can say this is the only one focused entirely on forensic DNA offering a whole week of workshops and talks.

What was your favorite part of the conference?

I found all the topics of the conference very interesting but the talks and workshop about genealogy really surprised me. The workshops with the material and the practical exercise also was a section I really loved.

Did you make any new connections with attendees that will assist in your research?

Some researchers stopped by my poster session, and were curious about my research. Although only a few of them are working on my same topic, they asked me to keep them updated on my experiments.

What is one thing that you learned while at the conference?

Listening to all the great talks, I learned how collaboration between researchers is fundamental to coordinate steps of investigations, for example, or solving critical criminal cases.

What are your biggest takeaways?

The determination; the strong will to never give up.

The stories I got from the speakers and their talks gave me an extra boost, a greater awareness of what I am doing and why, increasing my level of optimism.

Do you have any advice for other students or attendees considering attending ISHI?

First prepare to be surprised and to meet great researchers from all around the world.

My only advice is that for everyone working in forensic DNA, ISHI must be the meeting to attend. If you have any doubt, go, and you will realize once the conference starts.