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ISHI INTERNATIONAL SYMPOSIUM ON HUMAN IDENTIFICATION

SAN ANTONIO, TX | SEPT. 14–17, 2020

November 2019

The ISHI Report

News from the World of DNA Forensics

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The ISHI Report

Letter from the Editor

Welcome to the fall issue of the ISHI Report! We hope that many of you were able to participate in the *30th International Symposium on Human Identification* that took place in Palm Springs several weeks ago.

The symposium attracted a record number of participants with more than 1,000 people registered from around the world. Highlighting changes that have occurred since the first symposium was held in 1989, conference goers explored the "ISHI Museum" which featured displays of equipment used in early DNA typing labs and photos and memorabilia from historic events in forensic science including the OJ Simpson Trial.

This issue includes features and interviews with several speakers and attendees from the just completed conference. A very talented team of students pursuing advanced degrees in forensic science acted as "ISHI Ambassadors" during the meeting. Allison, Fabiana, Mirna and Rachel will relate their takeaways from the symposium and offer their advice for students interesting in attending the meeting.

Conference attendees and forensic scientists, Catherine MacMillan and Amy Jeanguenat chaired a table topic during ISHI to discuss how vicarious trauma can impact those who work on crime scene samples. Our interview with them provides their personal perspective on this issue and suggests resources that can be helpful to the forensic community.

Careers in science are often male dominated. Forensic science may be the rare exception. Ann MacPhetridge interviews multiple women representing various positions and levels of seniority in the forensic field. Her article offers insight into how women balance work and family responsibilities while advancing their careers.

Use of genetic genealogy to solve criminal cases was a topic addressed in pre and post symposium workshops and featured in several of the general session talks. Ken Doyle explores how genetic genealogy and other advances in technology are solving cold cases.

And speaking of new technologies, Chelsea Juarez describes how isotopes can provide useful information in cases where little is known about a decedent, including their country of origin. She provides practical guidelines for what samples and isotopes will yield the most useful results.

The aforementioned are just a sample of the features you'll find in this issue of the ISHI Report. As always, we welcome your ideas and written contributions to our publication. If you would like to share your expertise in a direct way with the forensic community, consider submitting a workshop proposal for ISHI 31. Workshop proposals are due January 10. All submissions will be reviewed by a selection committee and chosen based on timeliness of topic and perceived value to the forensic community. Workshop chairs will receive support including waived registration for ISHI 31 in San Antonio.

Warm Wishes,

The Editorial Board

Contact ISHI

Submit a Workshop Proposal for ISHI 31

The ISHI Program Committee invites those interested in presenting a workshop at the 31st International Symposium on Human Identification to submit a proposal.

All workshop proposals will be reviewed by committee and selected based on perceived interest to the forensic community. Workshop proposals are due no later than January 10, 2020.

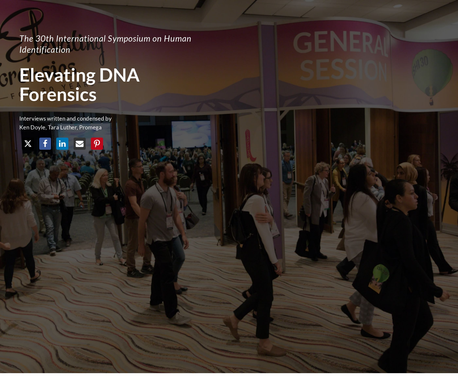
Chairs will be notified about the status of their workshop proposal by February 7, 2020.

The most successful workshops will address:

- A topic that is timely and important for the intended audience
- Learning objectives that are clear and appropriate
- Format that is interactive

Workshops should present useful content without a commercial bias.

Submit Your Proposal



The 30th International Symposium on Human Identification

Elevating DNA Forensics

Interviews written and condensed by Ken Doyle, Tara Luther, Promega

In the fall of 1989, a small group of forensic scientists, law enforcement officials and representatives from Promega Corporation gathered in Madison, Wisconsin, for the very first *International Symposium on Human Identification* (ISHI).

At the time, DNA typing was in its infancy and had not yet been validated as a forensic method. The available technology consisted of two methods: detection of restriction fragment length polymorphisms (RFLPs) and variable number of tandem repeats (VNTRs). Promega had developed products based on both analytical methods, which essentially provide a DNA "fingerprint" or profile for each individual tested.

Among the attendees at that first symposium was Tom Callaghan, then a graduate student. That experience made a significant impact on his career path. Last week, at ISHI 30, he presented a session on rapid DNA testing. Dr. Callaghan currently serves as a Senior Biometric Scientist for the FBI. In 1999, he was instrumental in launching the FBI's Combined DNA Index System (CODIS) and in 2003, he became the first CODIS Unit Chief.

ISHI 30 opened with a video offering a tongue-in-cheek look back in time at how technology—in general and in the field of forensics—has changed, from DNA sequencing girls to landline phones to fax machines. The video featured Dr. Cecelia Crouse, who left behind an academic career to work in forensics. Last year, she retired from the Palm Beach County Sheriff's Office, Florida, after nearly three decades of using DNA analysis to solve crimes.

Awareness of DNA in the Early Days

Cece Crouse, retired Lab Director of Palm Beach Sheriff's Office, recounts what it was like to work in DNA in the 80's and 90's.



Following Dr. Crouse, Bill Linton, CEO of Promega Corporation, welcomed the ISHI 30 attendees. He reflected on the growth that ISHI has seen over the past 30 years and the overwhelmingly positive response from the forensics community. He outlined his vision for the symposium and recalled seeing its global potential from the very beginning with that first meeting in Madison. (Read an interview with Bill on the past, present and future of ISHI in the April 2019 issue of The ISHI Report.)



Paul Holes presents the keynote at ISHI 30.

The keynote address at ISHI 30 was delivered by Paul Holes, retired Chief of Forensics with the Contra Costa County District Attorney's Office, California. Holes relates the chilling story of the case that dogged him for over 20 years—the notorious Golden State Killer, who committed over 100 burglaries, more than 50 rapes and at least 13 murders from 1974 to 1986. Ultimately, Holes solved the case in collaboration with a genetic genealogist, using the relatively new—and controversial—technique of forensic genetic genealogy (FGG) or investigative genetic genealogy. (Read the complete story in the April 2019 issue of The ISHI Report.)

Read more as our Student Ambassadors share their experiences at ISHI 30.



Mirna Ghemrawi

Ph.D. Student, Biochemistry Program/Forensic Track, Florida International University

Read the Interview



Allison Sherier

Ph.D. Student, Biomedical Sciences, Center for Human Identification, UNTHSC

Read the Interview



Rachel Kieser

Ph.D. Student, Biomedical Sciences, Center for Human Identification, UNTHSC

Read the Interview



Fabiana Taglia

Ph.D. Student, Forensic Chemistry, Florida International University

Read the Interview

Technology and the Human Factor

Although genetic genealogy itself is not new, the use of genealogy databases by law enforcement has attracted recent attention, spurred on by cases like that of the Golden State Killer. Holes emphasized that investigators never have access to an individual's DNA profile in the database; rather, they are simply examining how much DNA is shared by people in the database and the suspect. Nonetheless, due to public concerns about how the information may be used, a popular genealogical database, GEDmatch, recently changed its terms and conditions so that all users would opt out of letting law enforcement access their data by default. As a result, GEDmatch went from having over 1 million profiles accessible to law enforcement to around 120,000 opt-ins as of August 2019. These numbers were cited by several speakers at ISHI 30 as posing a serious challenge to the use of FGG.

The issues of privacy surrounding FGG have prompted a lot of discussion in the forensics community. At ISHI 30, the Department of Justice unveiled its new interim policy for FGG, which spells out specific criteria for cases where the technique should be applied. The policy is seen as an important first step to addressing some of the public's concerns.

Several other technological trends emerged at ISHI 30. Massively parallel sequencing was featured in many of the posters presented. The technology holds great promise for DNA forensics but it has been slow adoption in forensic units. The gold standard for DNA forensics still remains the analysis of short tandem repeats (STRs) by PCR amplification with specific probes, followed by capillary electrophoresis. In addition to MPS applications for both mitochondrial DNA sequencing and SNP analysis, the technical presentations at ISHI focused on DNA mixture deconvolution, probabilistic genotyping and rapid DNA testing to identify disaster victims.

Highlights from ISHI 30 in Palm Springs, CA

Keynote Speaker, Paul Holes, retired from the Contra Costa County District Attorney's Office, relates the chilling story of the case that dogged him for over 20 years—the notorious Golden State Killer, who committed over 100 burglaries, more than 50 rapes and at least 13 murders from 1974 to 1986. You can watch his presentation on our YouTube channel.

2019 saw continued interest in the power of genetic genealogy, and included the unveiling of new DOJ policy on how it should be used.

Other topics included Rapid DNA, emerging technologies in the field, massively parallel sequencing, and much more!



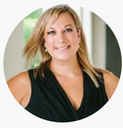
It's easy to get caught up in technological advancements, especially when considering the future of forensics. Sometimes, that can overshadow the underlying reasons driving the technology forward. In a compelling case study presented at ISHI 30, CeCe Moore, a genetic genealogist at Parabon NanoLabs, led the audience through the twists and turns of a case that began with the gruesome rape and murder of 18-year-old Angie Dodge in 1996. Through a combination of FGG and another recent development, genetic phenotyping, a suspect was arrested this year and is currently awaiting trial. Moore's case study, along with others presented, emphasized the importance of not only serving justice but also giving the victim's family the closure they sought.

That's the reason technology will continue to advance, and the reason that Promega will continue to support ISHI year after year. As Linton says, "The work they do for most of the people who attend is not academic work, it's not theoretical work, but every day they are involved in using advanced technology with outcomes that touch many, many lives."



I've Got 99 Problems from Public Perception

Secondary Transfer, Genealogy, Rapid DNA, DNA Mixtures and More



Interview written and condensed by
Tara Luther, Promega

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The television show, CSI (Crime Scene Investigation), was first introduced to viewers in 2000, and for 15 years, viewers followed Gil Grissom and, later, D.B. Russell and their team of criminologists as they used physical evidence to solve crime in Sin City.

According to Entertainment Weekly, crime drama television shows accounted for 13 of the top 50 television shows watched during the 2014-2015 season. The number of viewers these television shows brought in is a staggering 159.46 million viewers. Enter the "CSI Effect', which suggests that jurors who are regular viewers of the television show CSI will have unreasonably high expectations of the type of forensic evidence produced by the prosecution.

The term has outlasted the flagship show, and with the dramatic increase in public consumption of content through electronic and social media, the CSI Effect remains a consideration. But has it changed through the years?

In her poster at ISHI 30 titled *I've Got 99 Forensic Problems from Public Perception: Secondary Transfer, Genealogy, Rapid DNA, DNA Mixtures and More*, Rachel DeMeikin of DNA Labs International asked the question, "As a Forensic DNA Analyst in 2019, how do we set the record straight in the media, as an expert witness in the courtroom and to victim advocates contacting us to see if we heard about some box that gives DNA results in two hours?"

We interviewed Rachel to ask her about the shifts she's seen and to discuss the responsibility forensic professionals have to educate others in the courtroom or in the media.

Rachel, thank you for sitting down with us today!

Can you please describe the term 'CSI Effect'?

How did it come to be, and what did it originally refer to when first coined?

The term *CSI Effect* was perhaps first coined by Richard Willing in an article for USA Today in 2004. Willing described the phenomenon as false expectations of jurors that forensic science work is not only done in the time span of a prime-time television show but that it also foolproof. The origin of the term came from the popularity of the show CSI at the time.

In your experience, does the 'CSI Effect' still exist?

Has it changed over the years, and if so, how?

Since Willing's description, CSI Effect has become a catch- all for any number of juror fallacies; all cases have forensic evidence, if you have DNA you have solved the crime and an individual cannot be convicted without forensic evidence. Since the television show CSI's days of popularity there have been numerous publications identifying failures in the field of forensic science which have all but wiped away the infallible perception.

What do you think has caused this shift?

The expansion of social media and the spotlight put on individual cases of failures have caused this shift. The general public still expects forensic evidence in all of their cases, but they have increased skepticism in the results and often more personal knowledge, whether it be accurate or not, due to true crime popularity, podcasts and the media in general.



The National Institute of Justice is at the forefront of researching what's effective in forensic science efforts today.

Are you interested in rapid DNA, forensic genealogy, next generation sequencing, or other forensics research?

NIJ CAN HELP

NIJ National Institute of Justice

Do you feel that forensic analysts have a responsibility to address/correct public or media perception?

If not the analysts, who might be the appropriate party?

Forensic analysts do have a responsibility to address/correct public or media perception but that does not necessarily mean running to the local newspaper or responding directly to media. The best information we can provide is to family, friends and stakeholders. We all have the ability to educate our friends and family as to how forensic science actually works in the day to day.

Additionally, we can disseminate information to law enforcement, government, the court system and our individual communities through trainings and publications.

When it comes to media perception, it's best to have an individual or individuals designated to address any issues that may arise in the press. The priority should always be the communities we serve, and having designated personnel trained in how to address any concerns in the press and the proper procedures to follow is always the best course of action.

How might an analyst go about educating the public/media?

Should this be done inside the courtroom, outside, or both?

The courtroom provides a platform for analysts to educate the general public in the work that they do; however, there are also opportunities outside of the courtroom. Engaging with your community whether it be through philanthropic efforts, attending community events or volunteering to speak in community schools, all provides opportunities to teach the public about how the field of forensic sciences operates.

Additionally, social media can be used in a positive way to highlight new technology and the people behind the laboratory door. Channeling all social media through designated personnel again ensures that proper procedures were followed and the information being shared is appropriate.



Are there currently training courses available for analysts or those in the field on how to address the media?

Any interaction with analysts and the media should always be directed through their jurisdiction or laboratory's PR departments. With that said, it can also fall on the analyst to bring to the attention of the appropriate personnel if there is an issue that should be addressed.

For example, the Public Relations Department of the local law enforcement agency may not be aware that there is new technology changing the way evidence is processed. Getting this information out to the public so they can understand the changes in a meaningful and accurate way is important. Coordinating with all stakeholders, not just law enforcement and the court system, but also the community falls on the forensic laboratory to bring the issue to the attention of the appropriate personnel.

It's also just as important to train the forensic analysts how to handle inaccurate or bad press. For example, an overturned conviction, a failed admissibility hearing or technology misrepresented in the press should be topics discussed with laboratory personnel, so they are prepared in the courtroom.

Training may include distributing the publication to staff and discussing the types of questions they may face in the courtroom and potential answers to those questions. Internal policies should also be incorporated in training, so staff are familiar with situations where speaking with the media is and is not appropriate.

How would you address concerns government employees may have about being "on the record"?

Being on or off the record typically refers to speaking with press or attorneys. Outside of training, any of these discussions should be in controlled environments. Approvals should have been run through appropriate channels prior to discussions; i.e. scheduled depositions or pre-trial meetings.

With that said, training events are advantageous for all parties. At the end of the day you are the forensic expert! Trainings with press and the legal systems, prosecution and defense, should be encouraged.

It is also important to note, just because the reply should be 'no comment' in most situations that does not mean it has to be the end of the discussion. Misconceptions should be corrected; however, since the nature of forensic sciences is such a serious business the discussion of this business should be taken just as seriously and that starts by following the chain of command and preparing proper responses opposed to speaking off the cuff which is typically where misconceptions are born.

Ultimately, how do you foresee correcting misconceptions about DNA and forensic science benefiting the field?

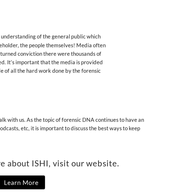
Correcting misconceptions improves the understanding of the general public which ultimately helps our most important stakeholder, the people themselves! Media often can be negatively driven. For every overturned conviction there were thousands of cases with sound forensic work performed. It's important that the media is provided with information showing the positive side of all the hard work done by the forensic community.

Rachel, thank you again for taking the time to talk with us. As the topic of forensic DNA continues to have an increased presence in the news, social media, podcasts, etc., it is important to discuss the best ways to keep everyone informed.

If you would like to learn more about ISHI, visit our website.

Learn More

Using DNA at the Border: Untangling Misconceptions



As the Trump administration's "zero-tolerance" immigration policy unfolded in Spring-Summer 2018, so too did a barrage of stories around migrant children being separated from their parents, and then mandates to re-unify them by judge-ordered deadlines. Also, the chaos were calls for DNA testing to screen migrants for trafficking, offers from genomics companies to donate tests and reagents, and the announcement of DNA as a tool to reunify families.

As legislators, civil liberties advocates, geneticists, ethicists, and attorneys got involved, the media sprang into action to translate for the public the convoluted history of the use of DNA in immigration.

Various tests were confused: consumer genomic services vs. commercial relationship testing services vs. forensic DNA laboratories.

In this interview, Sara Katsanis and Jen Wagner discuss how they hope to inform future policy discussions through research they've collected regarding what media reports on using DNA at the border. They also touch on common misconceptions the public may have regarding DNA and call on the forensic community to help correct those misunderstandings.

An International Symposium of Celebrations

The Tenth Anniversary of the GCLAITH

Ludmila Borges, Monica Perez, and Gloria de la Torre, Promega

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This year, the GCLAITH, Grupo Cientifico Latino-Americano de Trabajo Sobre Identificación Humana or Latin American Scientific Group on Human Identification Work celebrated its 10th anniversary during the *30th International Symposium of Human Identification*. The celebration included a champagne toast with commemorative cupcakes and the presence of long-time attendees to an event that was described as "the best GCLAITH meeting ever".

The GCLAITH began at ISHI 21 in San Antonio, TX in 2010, and has become the venue where opinion leaders and forensic scientists from Latin America gather to exchange information, challenges and knowledge in their own languages: Spanish and Portuguese. This meeting is relevant for the Latin American Forensic genetic community that covers over 20 countries, represented every year by analysts, lab directors and managers of different labs. The GCLAITH meeting has aimed to facilitate, improve and enhance their network.



Attendees of the 10th GCLAITH Meeting

The GCLAITH meeting began with a reduced group chaired by Dr. Daniel Corach from Argentina, who was also the head of the Latin American Scientific Group at that time. Over the past 10 years, this meeting has grown larger and larger, with chairpersons representing countries such as Argentina, Brazil, Colombia, the Dominican Republic, and Uruguay, and attendees from almost all the countries in the region.

A meeting "set apart" from others in the area, and the perfect partnership with ISHI.

The fact that the forensic geneticists attending can communicate and present their research in their native tongue creates an opportunity for networking, development and advancement.

Since Latin American countries share similar political, economic, and developmental levels, the GCLAITH also offers the opportunity to exchange experience and needs and challenges, constituting a key reason for its success.

Another important aspect that sets the GCLAITH apart from other meetings is that it is a scientific meeting with a strong emphasis on practical applications, without a commercial bias.

One of the benefits of the GCLAITH meeting is being part of ISHI's agenda. The GCLAITH meeting attendees also have a great opportunity to attend the world's largest annual conference focusing entirely on DNA forensics, allowing them easy access to the newest advances in forensics DNA technology from the best experts in this field. Attendees are also allowed access to all infrastructure, facilities, venue, meals, and social events. It´s convenient for the scientists sharing the same logistics and travel expenses to attend both ISHI and the GCLAITH meeting.



A presenter during the GCLAITH Meeting

It is also a good time to be around friends and colleagues who have the same interests and to learn about the latest advancements, trends, and research. The exhibits and posters provide ideas for implementing new procedures or technology, and showcasing their work to a larger audience.

A meeting that brings the LatAm forensic genetics community together around new developments and challenges in the field.

GCLAITH constitutes an annual opportunity to stay up to date with the current technologies, quality assurance standards, legal aspects, and learn more about the direction the field is headed in.

It is the best time for personal face-to-face conversations and interactions with colleagues and friends from Latin America, and a great opportunity for future collaborations and exchanges of knowledge and experience.

Over these 10 years, the GCLAITH meeting has featured speakers from the most important laboratories in Latin America, from Mexico to Chile, including Brazil. The main topics covered over the years include validation, complex sample cases, mixture interpretation, statistics, disaster victim identification (DVI), DNA database, genetic genealogy and the implementation of NGS technology.



Attendees of the 10th GCLAITH Meeting

Topics of important social and political natures were also addressed, as in the identification of missing persons, such as during the military dictatorship period in Argentina - "The Grandmothers of the Plaza de Mayo".

The GCLAITH success through the years has also involved sustained collaboration with other parties such as the ISHI organizers, Promega colleagues, and Promega distributors who have contributed to the participation of specialists from their regions.

We, therefore, encourage all the Latin American forensic community to attend the GCLAITH meeting. Even those who are not part of Latin America are very welcome.

Every year we look for a Spanish-speaking key opinion leader from different countries to be the chairperson of the meeting. We always try to get as many countries as possible involved. If you are interested in chairing a GCLAITH meeting, we invite you to visit the ISHI website or contact the person responsible for your region.

Monica Perez - Mexico and the Caribbean
Gloria de la Torre - South America (except Brazil)
Ludmila Borges - Brazil

An Update from The Organization of Scientific Area Committees (OSAC)

Share this article

The Organization of Scientific Area Committees (OSAC) for Forensic Science's Biology/DNA Scientific Area Committee has been extremely busy over the past year.

Between the SAC's three subcommittees, 23 standards have been written at the OSAC and submitted to AAFS Standards Board (ASB) for review and publication through the standards development process. All of these documents are available in draft format on the OSAC website. Additionally, several OSAC submitted documents have been published by ASB in the last year and these documents are now moving through the OSAC Registry approval process.

ANSI/ASB Standard 022, The Standard for Forensic DNA Analysis Training Programs, First Edition, 2019 is a parent document for all of the OSAC-developed biology training standards. This was initially written by the Biological Methods Subcommittee and was published by ASB and is currently undergoing the Registry approval process. The Biological Methods subcommittee currently has 13 additional documents at ASB covering topics ranging from training and validation in DNA methods to general serology standards as well as a standard related to preventing and monitoring DNA contamination. The subcommittee is currently drafting standards related to MPS/NGS as well as familial searching (both in conjunction with the Biological Data, Interpretation and Reporting Subcommittee) along with finishing up their training and validation standards.

The Biological Data Interpretation and Reporting subcommittee has written two standards that have been published at ASB, 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. These are currently undergoing the OSAC Registry approval process. Documents for standards or best practices related to probabilistic genotyping validation as well as forensic software validation have been submitted to ASB along with standards related to evaluating a laboratory's mixture interpretation protocol and assigning propositions for likelihood ratios. The subcommittee is currently developing standards or best practice documents related to rapid DNA, elimination databases, statistical analysis, determination of thresholds, interpreting data with contamination and failed controls, testimony regarding DNA activity level propositions as well as finalizing their training standards.

The Wildlife Forensic Subcommittee currently has six published standards at ASB: ANSI/ASB Standard 019, ***Wildlife Forensics General Standards***, First Edition, 2019; ANSI/ASB Standard 028, ***Wildlife Forensics Morphology Standards***, First Edition, 2019; ANSI/ASB Standard 029, ***Report Writing in Wildlife Forensics: Morphology and Genetics***, First Edition, 2019; ANSI/ASB Standard 046, ***Wildlife Forensics Validation Standards—STR Analysis***, First Edition, 2019; ANSI/ASB Standard 047, ***Wildlife Forensics Validation Standard—Validating New Primers for Sequencing***, First Edition, 2019; and ANSI/ASB Standard 048, ***Wildlife Forensic DNA Standard Procedures***, First Edition, 2019. Additionally, they have a short communication related to a panel of 12 microsatellite primers for bear that is being published in FSI Genetics as well as two additional documents that are currently at ASB for review and publication. At the subcommittee level, they are working on items addressing a variety of topics including statistical and in-house databases, the building of new panels for species identification, curation of reference samples as well as geographic assignment.

In the upcoming year as OSAC moves into its next phase, OSAC 2.0, the two human forensic subcommittees (Biological Methods and Biological Data Interpretation and Reporting Subcommittees) will be combined into one subcommittee addressing human forensic analysis. Currently these groups are already working jointly on documents (MPS/NGS and Familial Searching) so it is expected to be a smooth transition. And the group will not only be focusing on DNA analysis methods but also serological techniques which will be more in-line with the work being performed in the Wildlife Forensics Subcommittee. We look forward to the new challenges that will be brought on by the changes and expect the next year to be a busy one.

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.

To download the documents published by ASB, please see http://www.asbstandardsboard.org/published-documents/.

Telling the Stories of the Unidentified

Tara Luther, Promega

Share this article



While other girls her age were playing with dolls, Dr. Chelsey Juarez was jotting down notes about death and decomposition.

Growing up in the rural town of Gustine, California, she didn't have neighbors for miles around, and access to television was limited, but she did live within walking distance to a dairy farm.

At 8 years old, Dr. Juarez began to take notes about the cows who had perished and the changes that she observed during the decomposition process. As she grew to be a teenager, her interest also increased. She began to realize that there were clear stages of decomposition and began documenting them. It was then that she discovered her love for forensic anthropology, though she didn't know it at the time.

Growing up in a small town, Dr. Juarez felt that her career options were already predetermined; she could become a dentist, doctor, lawyer, or veterinarian. She chose to become a doctor, however an internship at a free clinic quickly proved that this was not the best fit for her. She recalls that a doctor at the clinic noticed her distress. When she told him that working with living people and providing them with bad news gave her enormous stress, he suggested working with the dead instead. She enrolled in a forensic anthropology class and was hooked. As she sat in the front row each day, the work mesmerized her, and a new path began to solidify in front of her.

It wasn't long before her passion for forensic anthropology began to intertwine with her ancestral roots. The daughter of a Mexican immigrant, Dr. Juarez always knew that she wanted to assist her Latino community, though she didn't know what form that might take. As a freshman, she had immersed herself in the College of Chemistry and the lab at the University of California, Berkley, and was quite familiar with isotopes. Through her background in chemistry, she knew it was possible to track items like drugs, plant material, or even pottery across a landscape, and a question presented itself: could these isotopes also track human remains? Might she be able to assist in identifying border crossers who had perished?

The Nation's Silent Mass Disaster

According to the National Missing and Unidentified Persons System (NamUs), [600,000 individuals go missing](#) in the United States each year. While many are quickly found, it is estimated that 4,400 unidentified bodies are recovered each year, with 1,000 of them remaining unidentified after one year. All told, there are currently more than 40,000 sets of human remains listed as unidentified in the United States.

While advances in DNA technology have assisted in providing identities for many, limitations remain, especially with populations that are non-native to the United States. Many who have perished while attempting to migrate from Latin American countries have no genetic relatives in the United States, and they are undocumented. Those who may be relatives are hesitant to come forward to submit DNA, because they are also undocumented. Without reference samples to use for comparison, the power of DNA is limited.
Additionally, many of the remains found have been exposed to the elements for years. Often, little or no tissue exists, and the skeletons may be incomplete, which makes obtaining a DNA profile challenging.

Forensic Anthropologists as Storytellers

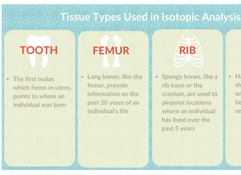
In cases where medical examiners are limited by the information that DNA analysis can provide, forensic anthropologists may be able to shed some light. As specialists in the hard tissues of the body, such as teeth, bones, fingernails, and even hair, forensic anthropologists tell the story of the deceased by providing a biological profile. This profile includes the sex, age, ancestry, living stature at the time of death, and a rough post-mortem interval. They are also able to determine if trauma or disease was present.
Once a biological profile has been completed, specially trained forensic anthropologists are able to perform an isotopic analysis to help determine where a person may have lived.

Isotopes are varieties of elements each with a different number of neutrons. The varying number of neutrons leads to differing weights, which can be picked up through mass spectrometer analysis.

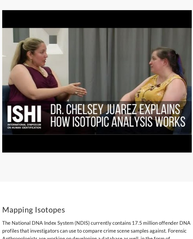
Isotopes vary depending on geographical location and may provide clues as to where a person was born, where they have recently lived, and where they were just months ago. When dealing with cold cases, this information can provide investigators with a place to start.

Traditionally, five different isotopes are used for forensic analysis. Hydrogen and Oxygen isotopes point to drinking water consumed. Carbon and Nitrogen isotopes provide information on a person's diet. Finally, Strontium, which is found in both food and water, can suggest additional information about diet or local environments, depending on the tissues tested.

There are three main tissues tested, and each sheds light on a different stage of a person's life. Teeth, such as the first molar, begin to form in utero, and complete themselves by the time a person turns three. Performing an isotopic analysis on the oxygen levels within a tooth sheds light on where a person was born. Longer bones, like the femur, provide information on the past 20 years of a person's life, while spongy bones like a rib or the cranium shed light on where someone has lived in the past five years. Finally, if you'd like to know where a person has been in the past several months, performing isotopic analysis on the oxygen levels of the hair or fingernails will be a great indicator.

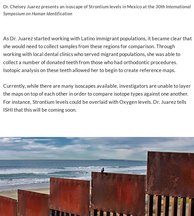


Dr. Juarez provides more information on the process of isotopic analysis in the video below.



Mapping Isotopes

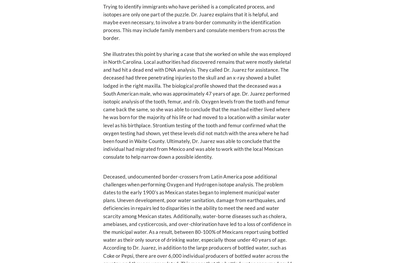
The National DNA Index System (NDIS) currently contains 17.5 million offender DNA profiles that investigators can use to compare crime scene samples against. Forensic Anthropologists are working on developing a database as well, in the form of geographic isotope maps ("isoscapes"). These maps, similar to the one below, show isotope levels by region.



Dr. Chelsey Juarez presents an isoscape of Strontium levels in Mexico at the 20th International Symposium on Human Identification

As Dr. Juarez started working with Latino immigrant populations, it became clear that she would need to collect samples from these regions for comparison. Through working with local dental clinics who served migrant populations, she was able to collect a number of donated teeth from those who had orthodontic procedures. Isotopic analysis on these teeth allowed her to begin to create reference maps.

Currently, while there are many isoscapes available, investigators are unable to layer the maps on top of each other in order to compare isotope types against one another. For instance, Strontium levels could be overlaid with Oxygen levels. Dr. Juarez tells ISHI that this will be coming soon.



How Can Isotopic Analysis Assist in Identifying Border Crossers?

Trying to identify immigrants who have perished is a complicated process, and isotopes are only one part of the puzzle. Dr. Juarez explains that it is helpful, and maybe even necessary, to involve a trans-border community in the identification process. This may include family members and consulate members from across the border.

She illustrates this point by sharing a case that she worked on while she was employed in North Carolina. Local authorities had discovered remains that were mostly skeletal and had a dead end with DNA analysis. They called Dr. Juarez for assistance. The deceased had three penetrating injuries to the skull and an x-ray showed a bullet lodged in the right maxilla. The biological profile showed that the deceased was a South American male, who was approximately 47 years of age. Dr. Juarez performed isotopic analysis of the tooth, femur, and rib. Oxygen levels from the tooth and femur came back the same, so she was able to conclude that the man had either lived where he was born for the majority of his life or had moved to a location with a similar water level as his birthplace. Strontium testing of the tooth and femur confirmed what the oxygen testing had shown, yet these levels did not match with the area where he had been found in Wake County. Ultimately, Dr. Juarez was able to conclude that the individual had migrated from Mexico and was able to work with the local Mexican consulate to help narrow down a possible identity.

Deceased, undocumented border-crossers from Latin America pose additional challenges when performing Oxygen and Hydrogen isotope analysis. The problem dates to the early 1900's as Mexican states began to implement municipal water plans. Uneven development, poor water sanitation, damage from earthquakes, and deficiencies in repairs led to disparities in the ability to meet the need and water scarcity among Mexican states. Additionally, water-borne diseases such as cholera, amebiases, and cysticercosis, and over-chlorination have led to a loss of confidence in the municipal water. As a result, between 80-100% of Mexicans report using bottled water as their only source of drinking water, especially those under 40-years of age. According to Dr. Juarez, in addition to the large producers of bottled water, such as Coke or Pepsi, there are over 6,000 individual producers of bottled water across the country, and they are unregulated. This means that the bottled water consumed could originate from an entirely different state than where the drinker is living, which can lead to discrepancies in the isotopic analysis. To counteract this, researchers have begun to collect samples from available bottled water.

Much has changed for Dr. Juarez since those early days on the dairy farm, but her passion for forensic anthropology has only grown. Currently, she is working with Dr. Belinda Akpa from North Carolina State University to see if [mathematical modeling](#) would allow forensic anthropologists to predict isotope levels and a region of origin for a victim based on what is already known about a region, such as precipitation. Doing so may one day allow for the prediction of a migrational pathway based on different tissue samples available from a victim. Dialing in the modeling may one day allow investigators to determine the path an individual had taken, which could prove to be powerful in the fight against human trafficking and illegal immigration.

What would Dr. Juarez like to see for the future? "I think forensic anthropologists and our DNA colleagues need to work more together. I think that we have a lot to learn from you guys and we have something to offer in return. I think that if we can be more collaborative, then I think we can do some really awesome things."

As for families who may have lost a loved one, Dr. Juarez has these words of comfort, "I hope that it never happens to you, but if you ever find yourself in a situation where someone that you care for or that you love goes missing, and you don't know what happened to them, know that there are a lot of people that are working on cases just like this. They're doing a lot of work behind the scenes, and they're very dedicated forensic professionals. You have to be your own advocate for yourself and for your family, but there are a lot of people who are doing everything they can to make these identifications."

A Forensic Scientist's

Path to Transforming Stress

Interviews written and condensed by Tara Luther, Promega

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Many analysts work in the background helping to develop investigative leads. Too often this also correlates to not receiving the benefits other positions may have to combat stress, vicarious trauma, and burnout. At ISHI 30, Amy Jeanguenat and Cathy MacMillan hosted a roundtable lunch discussion on stress in the forensic industry, coping mechanisms, and resources/research needed to evolve.

A quick look through the post-show survey showed that many were looking for more information on identifying and overcoming vicarious trauma in the forensic science industry, so we asked Amy and Cathy some follow-up questions to help you recognize the signs within yourself and others and to provide resources for those experiencing vicarious trauma.

Amy and Cathy, thank you very much for talking with us.

How did you both become interested in the topics of vicarious trauma and mindfulness?

What was your motivation behind leading the table topic discussion at ISHI?

CATHY: It was four years ago for me. I was dealing with a very difficult post-conviction case, feeling the burden of a large caseload, had personal stress from a divorce, was raising teenagers, and working through a past trauma that I never spoke about. A counselor introduced me to the topic. I really want dialogue around this topic to be more predominant and I reached out to ISHI to see what could be done at their 30th conference. Mental health is so critical in any career and it's time caseworkers started opening up. Happy caseworkers, happy scientists lead better lives. Carol Bingham at Promega introduced me to Amy and I was happy to see she had been involved in the dialogue of stress, vicarious trauma, burnout as well as strategies to use in the forensic industry. The reason I wanted to bring this topic up at ISHI was one of the main reasons I went into forensics. I wanted to help people. I have witnessed the effects of vicarious trauma in co-workers, family members and of course myself. I felt perhaps the young scientists could learn from my story.

AMY: I was happy Cathy and I were introduced and that she was so vulnerable with me from the start about what led her to learning about vicarious trauma. I hadn't heard of it either when I initially felt symptoms and just chalked up changes to my own perspectives and the chronic stress I felt as just being part of the job. I felt inadequately supported in my own experiences and looked to other industries that have been more proactive in dealing with tools to combat stress, depression, anxiety and pain. I enrolled in a mindfulness-based stress reduction program which improved my ability to communicate what I was experiencing and provided new tools to use. Although I found little support, I knew I couldn't be the only one dealing with impact of working in the criminal justice field. I dove into learning as much as I could about resiliency skills to help myself but knew I wanted to be able to pass information along to my colleagues. I have seen over the past couple years that when there are opportunities to connect, such as with the ISHI table discussion or through workshops, it becomes easier for people to open up and seek tools to help themselves.

Why do you think this topic hasn't been widely discussed previously?

CATHY: In forensics, I feel the culture is just to do the case, keep your number's up and once you complete the murder or rape you are working on, grab the next one. Culture in criminal justice values stoicism and there can be a reluctance to discuss anything where we may appear weak.

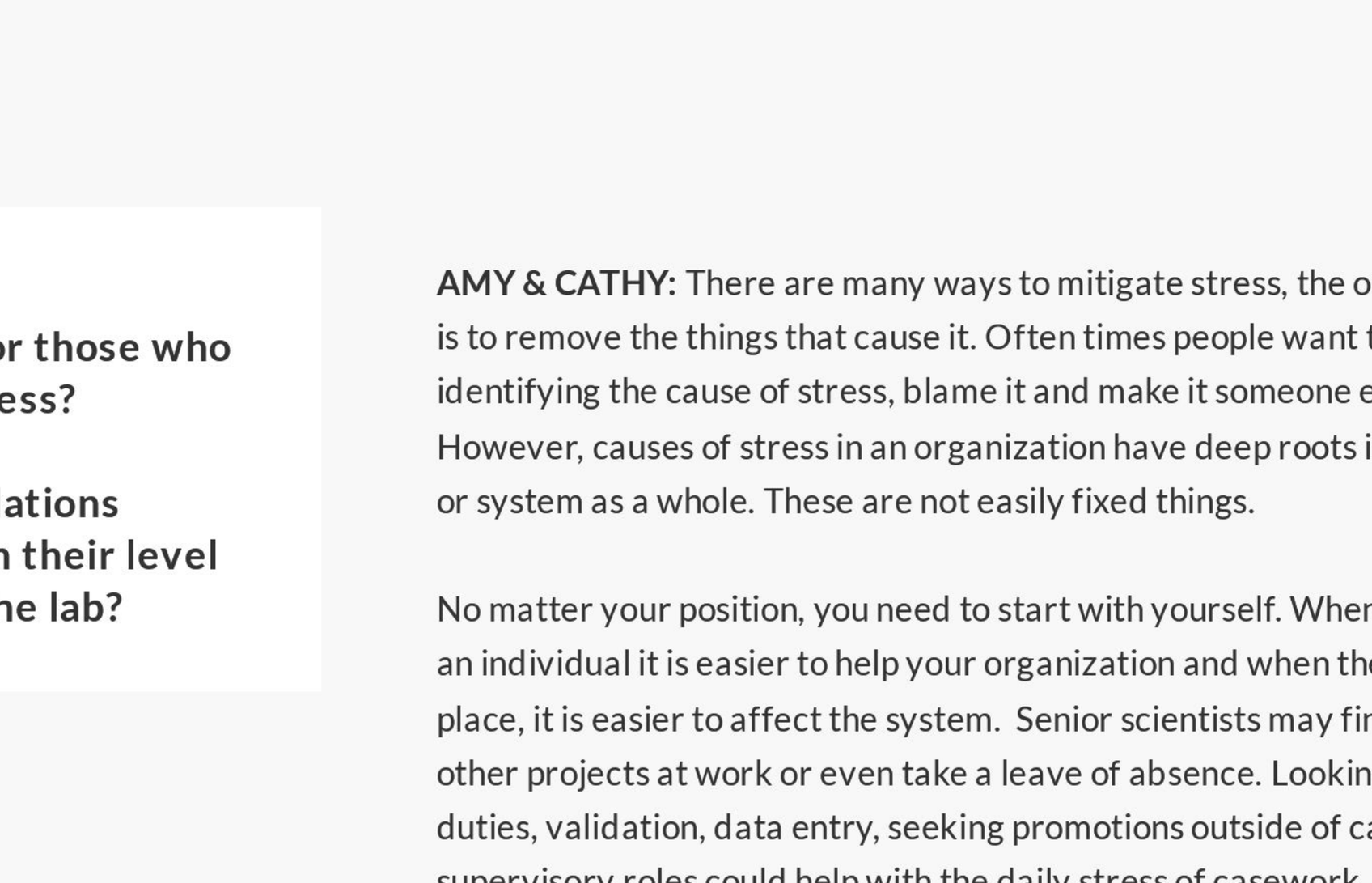
AMY: When I first started telling people I was bringing mindfulness and resilience to forensics I would get funny looks. Some of my first interactions I received responses such as 'forensics is just a negative space, its always been this way, it will never change;' ' I think you have to be a special person to do forensics, there needs to be a part in your brain you just close everything you see away in;' I've been around since the beginning of AFIS, this is just how the field is.' The biggest take away from these interactions was that education and awareness was needed first. I'm never one to like the response- that is just how things are- so I set out to change that!

What are the signs of vicarious trauma?

How might someone recognize these signs within themselves, and how might a manager recognize these signs in their employees?

CATHY: Personally, one-way vicarious trauma showed up for me is in how I raised my kids. I was especially fixated on trying to prevent them from being sexually assaulted, a direct response to my caseload and what I witnessed at work. This affected what they were allowed to do and who they spent time with. My sleep was also often affected as I found it hard to stop thinking about the endless tasks at work and managing a CODIS unit. I was often only getting between 2-5 hours of sleep when I was in a place of not effectively managing chronic stress.

AMY: Vicarious trauma can show up psychologically affecting safety, trust, and intimacy; it can affect frame of reference such a world-views and spirituality and it can have a sensory impact on bodily experiences such as feeling numb. Symptoms of vicarious trauma may be feeling on edge a lot or depressed about experiences encountered in casework, avoidance of certain activities or situations because of remembrance of frightening things encountered in casework, or experiencing intrusive thoughts that are hard to let go of resulting from work experiences. Recognition becomes easier when there is education and resources available to employees and when they feel supported by upper level management.



Do you have any recommendations for those who are experiencing stress?

Do your recommendations change depending on their level of seniority within the lab?

AMY & CATHY: There are many ways to mitigate stress, the only way to eradicate stress is to remove the things that cause it. Often times people want to start there, by identifying the cause of stress, blame it and make it someone else's problem to fix it. However, causes of stress in an organization have deep roots in the culture of the agency or system as a whole. These are not easily fixed things.

No matter your position, you need to start with yourself. When you are your best self as an individual it is easier to help your organization and when the organization is in a good place, it is easier to affect the system. Senior scientists may find it helpful to seek out other projects at work or even take a leave of absence. Looking for other tasks like QC duties, validation, data entry, seeking promotions outside of casework such as supervisory roles could help with the daily stress of casework. It is important to know when to pull yourself out of the lab and off of casework. Evidence based techniques that can move anyone, analysts and management, to a more balanced state include: meditation, gentle movement, mindfulness, gratitude, self-reflection, & compassion practices.

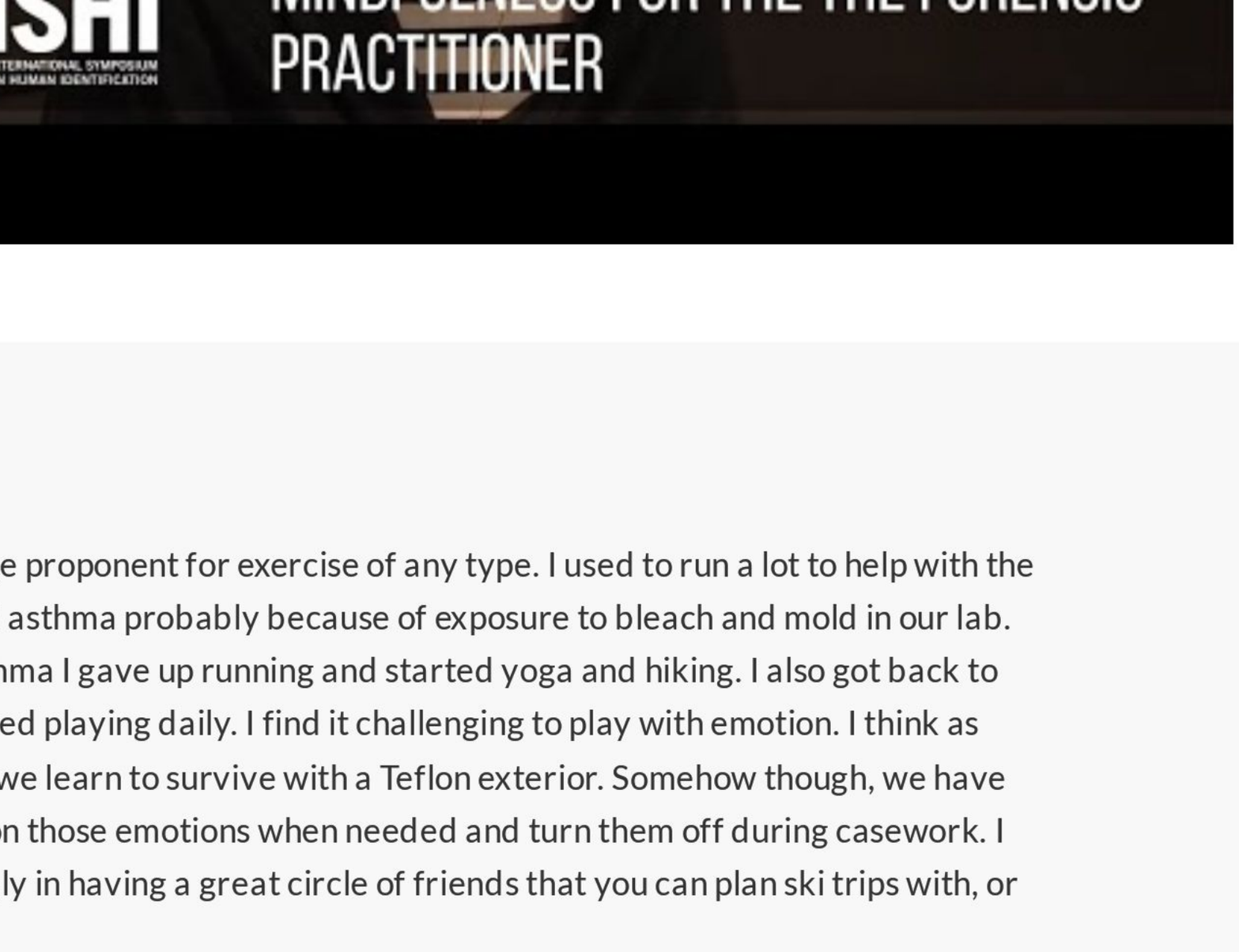
Are there programs or resources available for those experiencing vicarious trauma??

AMY & CATHY: Most State agencies have employee assistance programs (EAP) that can be a good place to start to better understand the resources available through work. An EAP may connect you with a counselor or a peer support system. Your medical doctor may also have ideas for your specific wellness initiative. Finding someone to talk to and connect with is important and it might not be the first counselor or peer supporter that you meet. Although, agencies that have implemented peer support have found value in having employees connect with others who have shared similar experiences and can offer hope. Some organizations have also successfully integrated therapy dogs to force employees to walk away from the desk and take a break.

AMY: One of my goals is to continue to progress the field in this area and I use a combination of my experience working in criminal justice with certifications in ancient wisdom, meditation, mindfulness, and yoga. I merge modern science with ancient wisdom to bring evidence-based techniques to criminal justice professionals to build resilience- the ability to bounce back from stress and trauma a little easier.

Mindfulness for the Forensic Practitioner

Amy Jeanguenat, Principal Consultant at Mindgen, describes what mindfulness is and how it can help a person to manage their stress, improve their decision making skills, and may one day help to reform the criminal justice system.



Are there simple exercises that you can recommend for someone experiencing stress in the moment?

CATHY: I am a huge proponent for exercise of any type. I used to run a lot to help with the stress, I developed asthma probably because of exposure to bleach and mold in our lab. Because of my asthma I gave up running and started yoga and hiking. I also got back to my piano and started playing daily. I find it challenging to play with emotion. I think as forensic scientists we learn to survive with a Teflon exterior. Somehow though, we have to be able to turn on those emotions when needed and turn them off during casework. I also believe strongly in having a great circle of friends that you can plan ski trips with, or lunches or trips.

AMY: Yes, what Cathy says- connection with friends, engaging hobbies, and physical movement are all resilience techniques and positive coping skills. A simple exercise is to do in the moment is to work with your own breath patterns. When your brain senses stress it starts the stress response which can increase heart rate, modify blood flow, and release hormones just to name a few. Slowing the breath is a quick way to tell the brain to chill out. When the diaphragm is activated it sends signals back to the brain that everything is okay and the body can return to a balanced state. Check out these 5 breath techniques that can be used in the moment or practice with them overtime to train your brain not to trigger so easily.

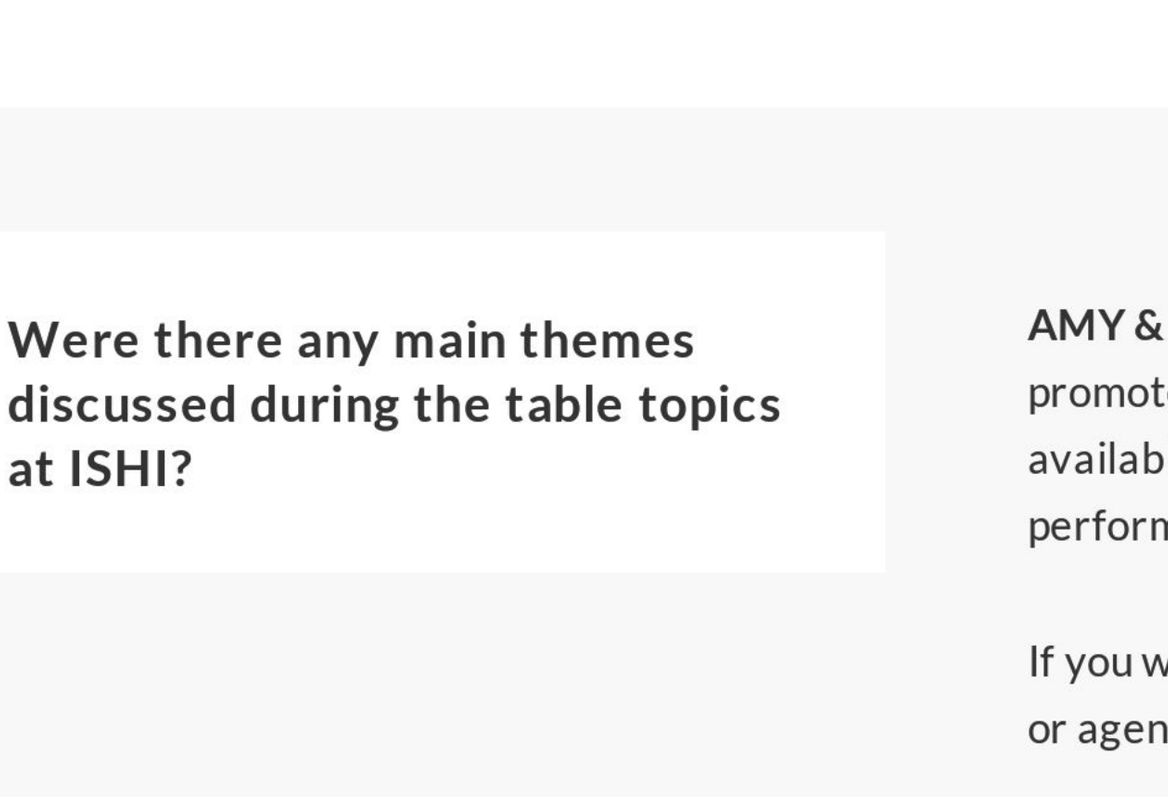
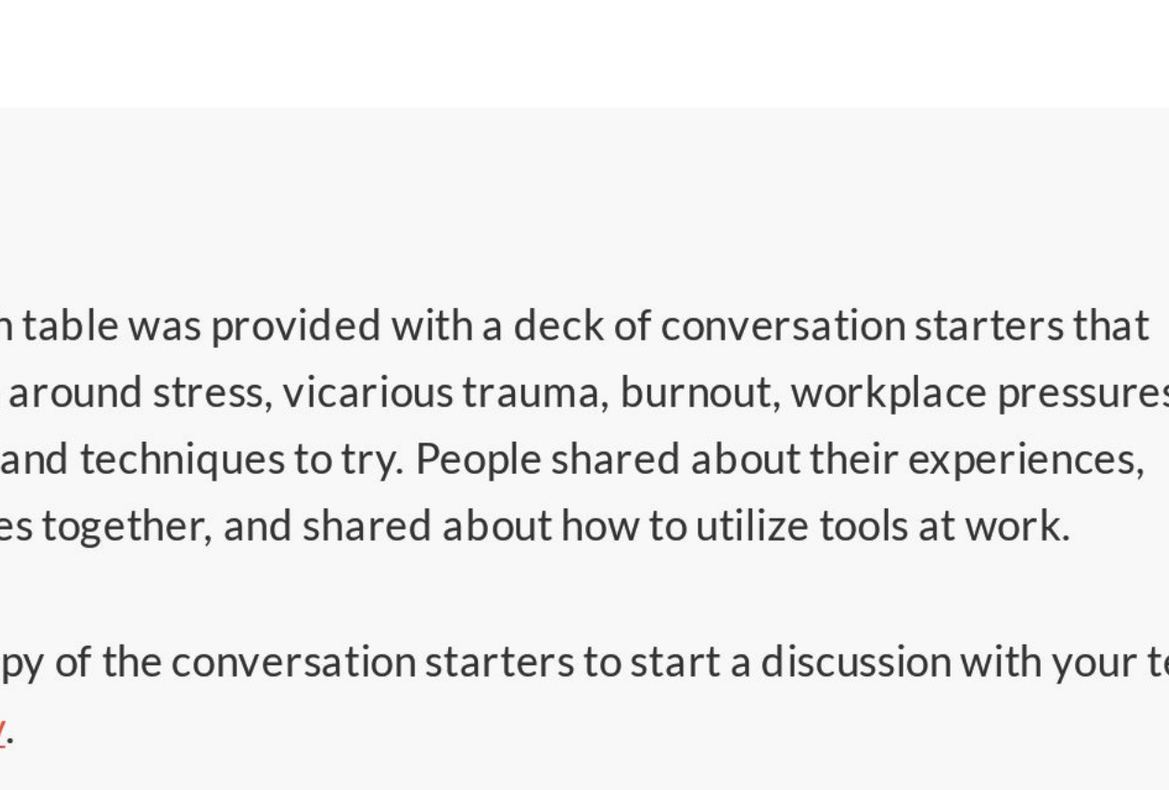
Is this a topic that is mentioned to students currently enrolled in forensic science programs?

If not, do you think it should be included in the curriculum?

AMY: Discussions around mindfulness in general are more commonly found at Universities but I am not aware of forensic programs that have made it a priority to prepare students in such a way to support their body, mind and spirit as they enter the forensic field. Starting to raise awareness at the University level and integrating resiliency programs will be key to future success. Some agencies are already creating interview techniques to identify people who have coping skills that could be utilized in the face of adversity and filtering out people who might not have developed those skills yet. As resiliency can be cultivated ideally it will be integrated during University studies, in on-boarding training, and continue to be made a priority throughout a person's career.

CATHY: I don't believe we spend near enough time honestly talking about the stress of this career. There is a false reality about forensics. We're not CSI we don't solve a case in 60 minutes. The TV viewer who thinks this is cool, walks away at the end of the show. As forensic scientists, we may look at evidence over an over again for biological fluid and DNA that have been utilized in sexual assaults and homicides.



Attendees participating in the table topic lunches at the *30th International Symposium on Human Identification*

Were there any main themes discussed during the table topics at ISHI?

AMY & CATHY: Each table was provided with a deck of conversation starters that promoted discussion around stress, vicarious trauma, burnout, workplace pressures, available resources, and techniques to try. People shared about their experiences, performed techniques together, and shared about how to utilize tools at work.

If you would like a copy of the conversation starters to start a discussion with your team or agency email Amy.

What's next for both of you?

Do you have any plans to continue the discussion outside of ISHI?

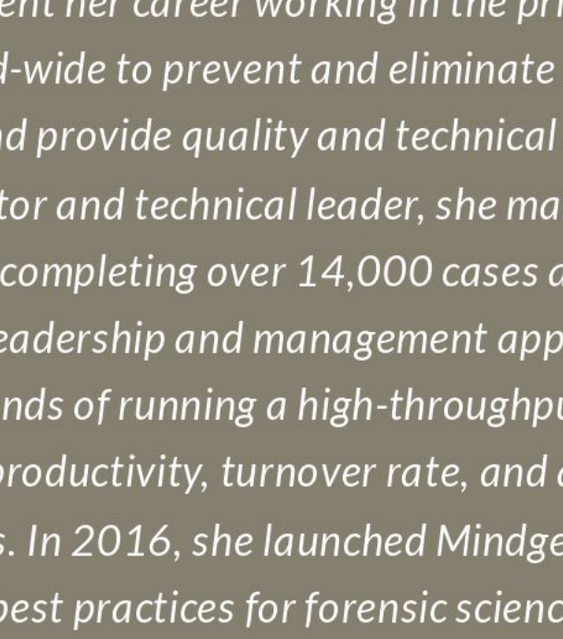
AMY: Outside of ISHI I have provided workshops at ASCLD, AFQAM, MAFS, and with crime labs. I am focused next on being able to extend resources outside of a workshop to help individuals build positive habits in the face of adversity. My passion is on providing skills to improve the quality of work and life with a bigger mission of positivity impacting the criminal justice system. I do this by offering 1:1 and small group coaching, workshops, and virtual programs in mindfulness-based resiliency skills.

CATHY: What's next…. that's a very good question. I want to keep this dialogue going and I want to keep on hiking and skiing. To be perfectly honest at over thirty years in casework, retirement is looking good.

Amy and Cathy, thank you very much for talking with us. We appreciate you leading the discussion on the topic of vicarious trauma and mindfulness at ISHI 30, and hope to see you again next year.

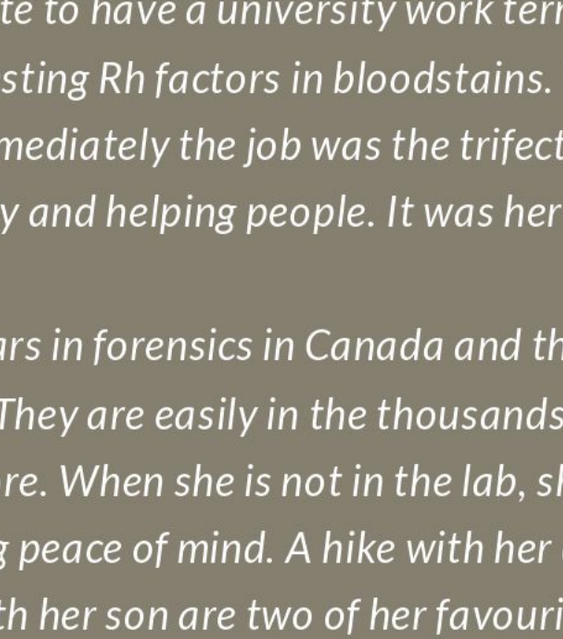
To learn more about The International Symposium on Human Identification, please visit our website.

Learn More



Amy Jeanguenat

Amy Jeanguenat has spent her career working in the private forensic industry supporting efforts world-wide to prevent and eliminate DNA backlogs, refine operational logistics, and provide quality and technical system support. As a former laboratory director and technical leader, she managed a staff of 100+ forensic DNA scientists completing over 14,000 cases and 80,000 database samples annually. Her leadership and management approaches constantly evolved in response to the demands of running a high-throughput laboratory. Workplace stress and its effect on productivity, turnover rate, and quality became a key focus of her research interests. In 2016, she launched Mindgen, LLC merging her interests in developing best practices for forensic science with the effects of mindfulness on human performance. Amy has completed training in mindfulness based stress reduction, ancient wisdom, and meditation teaching. She is applying these techniques to bring mindfulness to forensic science to help improve decision making and the quality of work & life.



Cathy MacMillan

Cathy MacMillan was fortunate to have a university work term at the RCMP Forensic lab in Sackville NB. She was testing Rh factors in bloodstains. Yes…those tests were a long time ago! Cathy knew immediately the job was the trifecta of her career goals. She felt strongly about law, biology and helping people. It was her niche, it was her calling.

Cathy has worked over 30 years in forensics in Canada and the US. She has lost count of the cases and testimonies. They are easily in the thousands. But there are certain cases that are woven in her core. When she is not in the lab, she's on the slopes or trails in Maine. The mountains bring peace of mind. A hike with her daughter, or down a slippery slope at Sugarloaf with her son are two of her favourite things.

Advertorial

An Introduction to the Maxprep™ Liquid Handler

Ken Doyle, Promega

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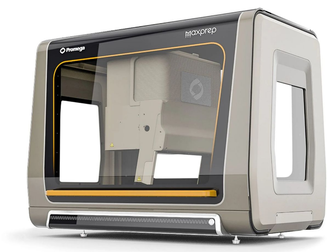
Automation As You Imagined

As forensic laboratories strive to meet the demands of processing an increasingly larger number of samples, establishing automated workflows can improve efficiency to meet those demands. While the Maxwell® platform addresses the DNA extraction needs of small- to medium-sized laboratories, many laboratories desire higher sample throughput as well as automation of one or more steps in their workflow.



The Maxprep™ Liquid Handler is the perfect complement to the Maxwell® line of products. The Maxprep™ instrument can process a variety of sample types, including extracted DNA or swabs and punches from reference samples. It can perform both pre-extraction sample processing and post-extraction methods such as DNA quantification setup, normalization and STR amplification setup, and CE setup. Intuitive and easy-to-use pre-loaded methods are being developed and tested by Promega and will be supported by Promega. The user-friendly software interface enables anyone in your laboratory to quickly run samples using the preprogrammed methods. No programming experience is required, since you do not need to create methods files or write protocols. In addition, the instrument modules can work in parallel, allowing them to perform pre-processing, extraction or post-processing tasks simultaneously to boost efficiency.

The intuitive touchscreen software provides a visual and interactive interface for preparing the liquid handler worktable and setting up customized, lab-specific method variants. Users can be trained and running samples within hours, compared to the time involved in developing or purchasing complicated liquid handling protocols with other systems.

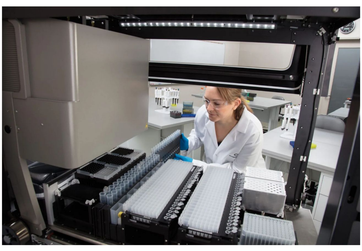
The Portal Access software acts as the information hub for sample tracking, DNA concentration data, and consumables and reagent tracking across multiple instruments. The software maintains sample traceability from the first DNA extraction step to the final CE setup step and recommends protocols for next steps as you move through your casework or database workflows. Portal even enables your laboratory to export data that can be used with other instruments in your workflow. You can place instruments anywhere in the laboratory and sample tracking information will be communicated from one device to the next.

Customized run reports are generated after every run on each instrument module. These reports can be exported automatically to a network location.

Pre-loaded Pre-extraction Protocols–Coming Soon!

Preprocessing for Maxwell® Instruments

Preparation of samples from tubes or plates for extraction on either the Maxwell® FSC or Maxwell® RSC 48 Instruments



Pre-loaded Post-extraction Protocols

Eluate Transfers

Transfer eluted DNA from Maxwell® elution tubes to more permanent storage containers. Reformat and combine multiple Maxwell® runs from elution tubes to microplates.

Quantification Setup

The automated method prepares 96-well PCR plates for DNA quantification by real-time quantitative PCR (qPCR) using the PowerQuant® or Plexor® HY Systems. Amplification mix creation and dilution of standards are fully automated. The software guides you at each step. Using the Maxprep™ Liquid Handler for your quantification set up removes user to user variability from qPCR and cuts hands-on time from an hour or more to just minutes.

Direct Amplification STR Setup of Punches and Swabs

Efficient direct amplification STR typing requires consistent sample transfer, effective reaction setup and robust chemistry. The Maxprep™ Liquid Handler is designed to quickly set up amplification plates of database samples using Promega STR kits.

DNA Normalization and STR Setup

The Maxprep™ Liquid Handler performs all transfer steps in conjunction with Portal sample tracking, greatly reducing the chances of sample mix-up from human error. Pre-installed methods for DNA normalization and STR setup of casework samples using Promega STR kits are available. The Maxprep™ instrument can process extracted DNA samples that are in 0.5ml elution tubes on Maxwell deck trays and various storage tubes and plates, identifying the type of sample vessel by their barcodes. You can process up to 48 samples in 60 minutes.

CE Setup–Coming Soon!

Set up 96 well plates for analysis on capillary electrophoresis instruments





Service and Support

The Maxprep™ Liquid Handler is backed by a comprehensive standard warranty, expert service and a full line of additional service products. With a comprehensive menu of service and support options, you can be confident that your equipment will be working properly and ready when you need it. Installation Qualification (IQ), Operational Qualification (OQ) and Preventive Maintenance (PM) services ensure that your instrument is fully functional and provide documentation that the instrument is operating to defined specifications.

The Maxprep™ Liquid Handler is installed by qualified Promega personnel who will test the instrument, document installation actions and train laboratory personnel to successfully operate the instrument. Additionally, Promega can offer flexible, consultative Validation Services to those forensic laboratories who wish to add the Maxprep™ instrument into their workflow, but who lack the resources to do so themselves.

With an interface that's both intuitive and efficient, the Maxprep™ Liquid Handler may become the most popular tool in your forensic laboratory.

To learn more about personal automation for your forensic laboratory, visit: www.promega.com/MaxprepForensics

Pursuing Justice:

The State of the Sexual Assault Kit Backlog in the United States

Tara Luther, Promega

Share this article

Assistant Prosecuting Attorney of the Genesee County Prosecutor's Office, Jen Janetsky, took the stage at ISHI 29 and asked a question, "Anybody heard of Flint, Michigan lately?" She began her presentation by describing a time when Flint was a prosperous city, booming due to the nearby GM plant. That all changed in the 1980's when the decision was made to close the Fisher One Body Plant and 80,000 jobs were lost. Those who could leave did, and those who stayed faced the reality of living in a city that had lost half of it's tax base.

200 sworn officers turned into 88, and Murdertown, USA was born. Priority was given to homicides, with only one officer left to focus on the one hundred sex crimes committed each year. Over time, the shelves filled until they held 1,047 untested sexual assault kits. You can feel Jen's passion and outrage as she exclaimed, "These 1,047 kits represented 1,047 men, women, and children who have been victimized in the most personal way a person could possibly be violated." She continued, "And we left them on the shelf."

One of those kits represented a woman named Jessica, who was a bubbly, vivacious newlywed. She also suffered from a degenerative disease which confined her to a wheelchair and left her able to only move her left foot. After waiting for months, Jessica and her husband, Eugene, moved into a specially designed home with their 18 month-old daughter, and were in awe of how lucky they were.

Until one August night, they awoke to a loud banging noise that increased in volume until Eugene got up to check on the noise. It was clear that their luck had run out when Eugene returned to the bedroom with a stranger who held a knife against his neck. What happened next is unthinkable. Forced to stand by and keep his daughter quiet, Eugene watched as Jessica was repeatedly assaulted, unable to move or defend herself.

Though the stranger threatened their lives, Jessica called the police. Jessica described the assailant, and swabs were taken from multiple places as a sexual assault kit (SAK) exam was done. Due to circumstances, that kit sat on the shelf for five years.

Sadly, Jessica's story is not uncommon, and hundreds of thousands of kits sit untested across the United States. Since 2004, the Department of Justice has awarded nearly $1 billion in grants through the DNA Capacity Enhancement and Backlog Reduction (CEBR) grant program, yet backlogs continue to exist at many state and local government crime labs.

The CEBR grant program has two goals:

1. Increase laboratory capacity for DNA analysis
2. Reduce backlogs of DNA evidence awaiting analysis

CEBR awards grants non-competitively to states and units of local government based on a formula set by the Department of Justice that allocates certain amounts to each state. This formula considers each state's population and associated crime levels and guarantees a minimum amount for eligible applicants from each state.

In March of 2019, the United States Government Accountability Office (GAO) released their Report to Congressional Requesters.

Do We Know Where the Backlog Stands?

It is difficult to capture the true number of untested kits for many reasons. The GAO Report lists the following:

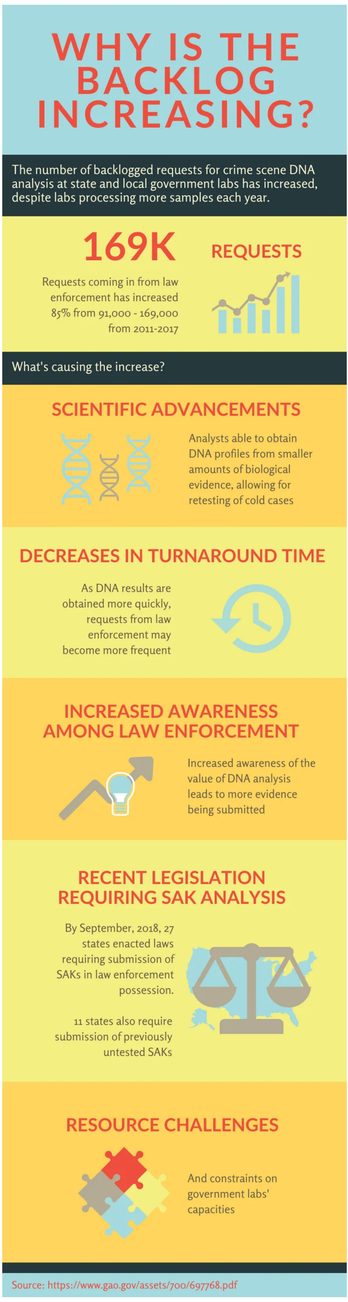
- Difficulty locating SAKs
- Insufficient or inconsistent information technology (IT) systems
- Lack of incentive or awareness; law enforcement may be reluctant to provide counts, as this may be seen as poor performance or may expose them to legal action
- Resource constraints
- Lack of understanding which SAKs should be included in the inventories
- Ensuring counts are reliable and up to date; the number of unsubmitted SAKs is constantly changing, so counts are only accurate for a small period of time.

Despite this, efforts have been made to quantify the backlog. The National Sexual Assault Kit Initiative (SAKI) grants provide funding to state law enforcement agencies and units of local government to help them address unsubmitted SAKs. Before receiving an award, grantees must first take inventory of their unsubmitted SAKs.

The New York County District Attorney's Office (DANY) also awards funds to for the purpose of analyzing SAKs and measures the number of SAKs submitted to labs for analysis.

The Joyful Heart Foundation, a survivor's advocacy organization, continually monitors the number of unsubmitted SAKs in law enforcement custody. As of October, 2018, they had collected numbers from 35 states and 32 cities or counties. Data has also been collected from 26 states with laws requiring SAK inventories to be conducted.

One thing we do know is despite additional funding and efforts, the nation-wide backlog is increasing.



The backlog continues to be a problem throughout the United States, but by taking a closer look at these types of grants available, there is hope on the horizon. In fact, it was a grant from DANI that allowed Jessica's kit to be tested. It was then that Jen's team discovered that Jessica's attacker was already in CODIS for committing drug offenses around that same time period.

Michael Coleman was arrested, and this time it was Jessica and her testimony in a preliminary trial that scared him. His defense attorney approached Jen on a weekly basis and begged for an offer that he could take to his client. Each time, her answer was the same, "No, you will never get an offer in this case. You will never get an offer from me."

It took a couple of years before Jessica had her day in court. Even before the trial had begun, Michael asked his attorney, "Can I plead as charged?" He is now serving a 50-75 year sentence, on a kit that never would have gotten off the shelves if not for the availability of grants.

Jessica waited years for justice to be served, but she never faltered. On the day she met Jen and her team, she said, "I knew you'd come eventually. I knew you'd come."

Calendar of Events

Deadlines

January 10, 2020

Workshop Proposals Due

February 5, 2020

ISHI Registration Opens

June 5, 2020

Oral Abstracts Due

June 5, 2020

Interesting Case Abstracts Due

July 5, 2020

Poster Abstracts due

July 5, 2020

Early Registration Deadline

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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?

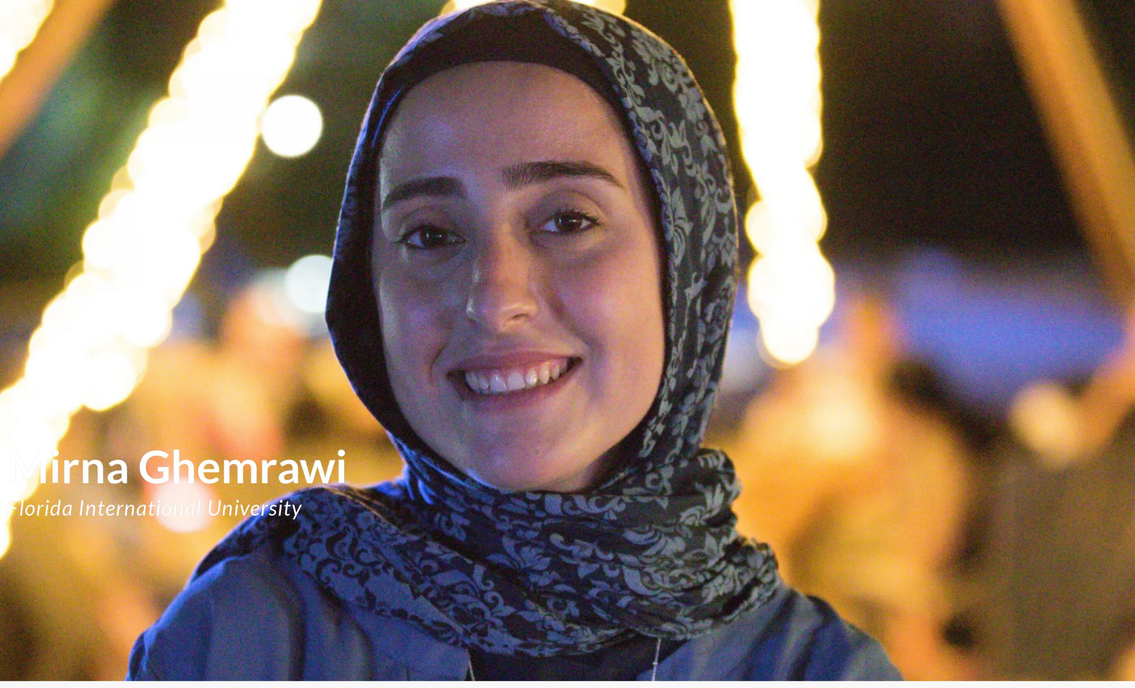
The determination; the strong will to never give up.

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.



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.



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.



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.