

Workshop will explore the latest topics in DNA sponsored by Thermo Fisher

- An Overview of the Connecticut Rapid DNA Program
- The Development & Implementation of Best Practices and Standards for using Forensic Genetic Genealogy in Criminal Investigations
- Analyzing Workflow Changes to Incorporate New Technology
- The Application of The Skin Virome for Human Identification
- The Validation of Massively Parallel Sequencing for Mitochondrial Casework (mitoMPS) at NYC OCME
- Application of the human virome to touch objects and hair shafts

An Overview of the Connecticut Rapid DNA Program

Chery Carreiro

Chery Carreiro began her forensic career at the Connecticut Division of Scientific Services in 2007. In addition to overseeing the laboratory operation, as the Assistant Director of the Forensic Science Laboratory, Cheryl oversees grants, contracts, and a very busy Rapid DNA program. With nearly 14 years of casework experience as a DNA analyst, Cheryl co-developed Connecticut's first Rapid DNA program for use on crime scene samples. Cheryl holds a B.S in Biology, minor Chemistry from Fairfield University and a M.S. in Forensic Science with a concentration in Criminalistics from the University of New Haven.

The Development & Implementation of Best Practices and Standards for using Forensic Genetic Genealogy in Criminal Investigations

Since its inception in 2018, Forensic Genetic Genealogy (FGG) has become one of the fastest-growing new investigatory tools to be implemented into criminal investigations. The speed of this implementation has been alarming, yet its success and impact in resolving cold cases cannot be denied. As with all new methods, tools, and techniques, it is critical that robust procedures, best practices, and standards for their use are developed and implemented. With FGG, its use has become widespread across the United States, yet there exists only minimal guidance and policy surrounding it. Critics of the use of FGG have raised concerns over genetic privacy, individual privacy, and informed consent, to name a few. Members of the law enforcement/forensic science community that have been hesitant to embrace this new tool have cited the lack of guidance, understanding of legal implications, and defined set of procedures for using it as a concern. Therefore, it is necessary that robust best practices and standards are developed for using this investigatory tool, with a focus on balancing the best interests of the public in terms of both protecting their safety and protecting their privacy. It is essential that all stakeholders are given the opportunity to provide input in the development of national best practices and standards, which must include not only legal experts and policymakers, but also ethics and privacy experts, forensic practitioners, and those with in-depth knowledge and expertise in carrying out the many steps involved in a thorough FGG investigation. Over the last 30+ years, Forensic DNA (STR) analysis has become the gold standard of forensic science. This was and still is, achieved through methodical diligence, robust practices, and constant revision and oversight. The same is now required for FGG in order to cement its credibility within the industry, and also to sustain, even grow, its use in investigations. This workshop will discuss a comprehensive set of recommendations for best practices and standards for the use of FGG in criminal investigations, with a proposed mechanism for their implementation.

Dr. Glynn

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

Dr. Glynn, who joined the University of New Haven in 2014, teaches both undergraduate and graduate courses in forensic science, focused on forensic biology, forensic DNA analysis, and Forensic Genetic Genealogy (FGG). Her research interests are focused on FGG, and a broad range of applications for this novel investigatory tool. This

includes investigating the effects of degraded samples and novel technologies, establishing best practices, the international feasibility of this tool, historical applications, and ethical considerations, to name just a few. Her other research interests include Rapid DNA analysis, RNA (mRNA and miRNA) analysis, Single Nucleotide Polymorphism (SNPs) applications, and DNA Methylation markers.

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

Analyzing Workflow Changes to Incorporate New Technology

Ryan Gallagher

Ryan Gallagher is the Criminalistics Unit Manager at the Philadelphia Police Department's Office of Forensic Science, where he is responsible for the daily operations of the laboratory that processes all of the DNA cases for the City of Philadelphia. He earned a bachelor's degree in Molecular Biology from Temple University and a master's degree in Forensic Science from Arcadia University. He began his career in forensics with the Philadelphia Police Department in 2006. For more than ten years, he worked in the Criminalistics Unit processing hundreds of cases that involved the identification of biological fluids and/or ignitable liquids. For the past five years, Mr. Gallagher has overseen the operations of the Criminalistics Unit.

The Validation of Massively Parallel Sequencing for Mitochondrial Casework (mitoMPS) at NYC OCME

Validation of a new technology for casework is an involved process that often does not follow expected paths. While the framework of requirements for validation are readily available, there are often unforeseen challenges. We will review the process of validation for mitochondrial massively parallel sequencing (MPS) used by the NYC Office of Chief Medical Officer to highlight different approaches, and offer recommendations to other labs considering validation of a new technology.

Jonathan S. Kui

Jonathan S. Kui is currently the Laboratory Director of the forthcoming DNA Laboratory of the Office of the Hudson County Prosecutor. Previously, Jonathan was a Criminalist IV at the NYC Office of Chief Medical Examiner, in the Department of Forensic Biology. He was a post-conviction case coordinator for the laboratory, and was a Validation Lead for mitochondrial massively parallel sequencing (MPS). He had been a casework analyst since joining the laboratory in 2008, and a supervisor since 2014.

Application of the human virome to touch objects and hair shafts

Carlos Riera-Ruiz

Carlos is originally from Ecuador where he received his bachelor's degree in Agricultural and Biological Sciences and a professional MS in Project Management. In Ecuador he was a research assistant in the Biotechnology Research Center (CIBE), one of the most prestigious Universities in Ecuador, Escuela Superior Politécnica del Litoral. There he studied plant pathogens of rice and published his work in high impact journals. This experience led him decide to pursue graduate studies and a career in science. He came to the US with a Fulbright scholarship and got his MS in Biology at the University of Nebraska-Lincoln. He is currently pursuing a PhD in Complex Biosystems in which he is applying microbial systems ecology, data science and "-omics" tools for forensics applications. He likes writing scripts in Python, R and Shell Script to automatize his computational workflows. In his free time, he is a tennis and volleyball enthusiast and a not-very-good guitar player.