



### **B98 A Comprehensive Review of Data From the DNA Analysis of Firearm Evidence at the San Diego Police Department Crime Laboratory**

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After attending this presentation, attendees will be informed on the viability, usefulness, and typical results obtained in the forensic DNA examination of firearms evidence.

This presentation will impact the forensic science community by educating the forensic community on an optimized method developed for DNA analysis on firearms in terms of sample collection sites as well as DNA extraction and PCR amplification methodologies.

The presentation will seek to highlight the probative nature of this evidence and its significant role in criminal cases. The need for communication between, and cooperation among, the various laboratory sections will be discussed as a key element to obtaining the most successful and complete information from the evidence. Knowledge of the affect of one discipline on the ability of obtaining results in a second discipline is vital to the implementation of a program for performing DNA analysis on firearms evidence. The current model of inter-section collaboration at the San Diego Police Department Crime Laboratory will be presented.

The authors will present data suggesting the necessity for this type of analysis from national, state, and local perspectives. Firearms are pervasive in society and are routinely involved in crimes. In 2005 alone, nearly 400,000 gun crimes were reported nationally and approximately 9% of all non-fatal violent crime involved a firearm. The prevalence of the use of firearms in the commission of crimes exemplifies the need for the allocation of additional DNA resources to the analysis of firearms evidence. Conducting DNA analyses in felon in possession of firearms cases must be viewed as keystone in any effort to proactively reduce gun violence.

Firearms evidence has traditionally been submitted to the Laboratory for functionality tests, firearms comparisons, and latent print development. Estimates of the successful latent print development from firearms evidence at the SDPD Crime Laboratory suggest that only 5% of firearms yield latent prints. Of that 5% only a small fraction have enough ridge detail for meaningful comparisons. The advances in DNA technology have created an opportunity for the science to play a critical role in determining who has come in contact with a firearm.

The presentation will introduce an optimized method of analysis for firearms evidence, developed by the SDPD Crime Laboratory, such that 90% of firearms examined yield some DNA information. The presentation will highlight this method and detail the areas on firearms most likely to yield DNA. It will also demonstrate the superiority of magnetic bead based extractions over the classic organic extraction method, and how supplementing AmpFISTR® Identifiler™ amplification reactions with additional *Taq* DNA polymerase and bovine serum albumin (BSA) leads to a greater success in obtaining DNA results.

The San Diego Police Department Crime Laboratory has compiled the data from the analysis of firearms evidence since 2004 and the presentation will break down this data to reveal insights into the typical DNA results from firearms evidence in order to demonstrate the challenges faced when performing this type of analysis. The authors will discuss the limitations of the DNA analysis of firearms evidence and demonstrate the critical need for laboratory staff DNA databases through examples of actual casework. The authors will present cases that demonstrate the benefits of the improved methodology and how probative findings may influence criminal cases in court.

**DNA, Firearms, Forensics**