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### **B90 Introducing New Instrumental Technologies in the Forensic Drug Laboratory — Learning From Past Experiences**

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After attending this presentation, attendees will better understand the difficulties encountered when introducing new technologies into the laboratory.

This presentation will impact the forensic science community by presenting and discussing numerous factors affecting the introduction of new technologies into the laboratory and how those difficulties can be overcome by learning from past experiences.

Forensic laboratories responsible for the analysis of seized drugs must be equipped with the scientific infrastructure necessary for the qualitative and quantitative analysis of these materials. Minimum standards for the analysis of seized drugs have been published by the Scientific Group for the Analysis of Seized Drugs (SWGDRUG Recommendations Version 7.0; [www.swgdrug.org](http://www.swgdrug.org)). SWGDRUG recommends that laboratories implement analytical schemes involving the combination of Categories A, B, or C techniques, classified as such based on their maximum degree of discrimination. Depending on their legal jurisdiction, laboratories throughout the United States and abroad should implement analytical schemes to fulfill these minimum recommendations while providing the law enforcement and legal communities with accurate and timely results.

Depending on their analytical scheme and the suspected drug under investigation, analysts have the choice of utilizing a wide array of chemical and instrumental test procedures. Color and microcrystalline tests provide presumptive information, while instrumental techniques like Gas Chromatography/Mass Spectrometry (GC/MS) and Infrared (IR) spectrophotometry have become mainstays in the forensic laboratory because of their ability to provide structural information for a compound and, for most cases, a final identification. But these analytical techniques, although proven robust, do have limitations on their applicability.

New technologies are developed every few years that can improve the quality of forensic analyses and also potentially decrease turnaround times for results. Research and pharmaceutical laboratories are often the primary users of such new technologies, a result of the private nature of these industries, as opposed to the government-funded crime laboratories. With high caseloads and the continual appearance of new designer drugs, the need to introduce and establish these technologies in the forensic laboratory is essential; however, the introduction of new products and instrumentation sometimes proves to be a difficult task. This presentation will discuss some of the challenges faced when introducing these technologies into the crime laboratory. Examples of new technologies (Liquid Chromatography/Mass Spectrometry (LC/MS), Ultra High-Performance Liquid Chromatography (UHPLC), and Raman spectroscopy) will be discussed.

Some of the factors hindering the use and establishment of new analytical techniques in the seized-drug laboratory are obvious. The most often cited are lack of funding sources and the complacency among laboratory personnel; that is, the unwillingness to “try something new.” Other factors are not often discussed, but they play equally important roles in the matter. Managers and analysts need to work together, be willing and comfortable about changing their “routine ways,” especially when the alternative new technology can provide a higher-quality result in a faster manner. Even when laboratory personnel are willing to look into new technology, large backlogs and the lack of expertise may hinder their progress. Furthermore, managers and analysts are often overwhelmed by the information provided by instrument vendors, and quality assurance requirements and procedures are not always considered during vendor-laboratory discussions. Many times this results in laboratories acquiring instrumentation with much higher capabilities (and cost) than they realistically need. And finally, but certainly not less important, are the lack of training opportunities for analysts willing to use the new technology.

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#### **Criminalistics, New Technologies, Mass Spectrometry**