



Pathology/Biology Section - 2015

H29 Genotyping of Used Drug Stamp Bags With Special Attention to the Minor Contributor

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After attending this presentation, attendees will better relate to the importance of evidence collecting, specifically DNA, of stamp bags found on-scene. Attendees will also learn of new and original changes to procedure to produce higher DNA yield.

This presentation will impact the forensic science community by showing that DNA can be obtained in sufficient quantities for a short tandem repeat profile from drug evidence at a crime scene and by providing several useful testing methods which vary in terms of time and expense.

Currently under review in the United States court system is the question of what penalty, for sentence and category of crime, should be applied to a distributor of illegal drugs in the event that those drugs were responsible for the death of a user. Touch DNA (tDNA) is the DNA that remains behind when an individual touches an object. It is very common for the tDNA to also be characterized as trace DNA, which is defined as being less than 100 picograms. It has been found that tDNA can be left behind on a number of items that a user might touch. A large quantity of drugs can normally be found wrapped up in magazines. Some research was done as to whether DNA could be obtained from these magazines; it has so far been determined to be improbable; however, since the drugs are distributed to users in smaller bags, known as “dime bags” or “stamp bags,” and these bags are normally made out of some waxy material, it was hypothesized that DNA could be obtained from these waxy, non-porous bags.

Research suggests that a detectable amount of DNA can in fact be obtained from drug stamp bags. The preliminary test, which had an average concentration of 1.47E-03 nanograms per milliliter, was conducted by using a double-swab method using PSS Select® Cotton Swabs on touched bags. The DNA was extracted via the Promega® DNA IQ™ System kit and analyzed on the rtPCR machine using the Life Technologies™ Quantifiler® Human DNA Quantification Kit provided by the laboratory. There was also a known DNA positive control along with a no DNA negative and a non-touched bag negative control. Genotyping was done with an ampFISTER® Identifiler® Plus PCR Amplification Kit on the 3130xl Genetic Analyzer.

It was hypothesized that a large amount of DNA was being lost due to the PSS Select® Cotton Swabs. In addition to the double-swab method, an enzyme was used to enhance the DNA yield. Also, sample bags were cut into pieces and a reworked PCI method was developed to more greatly enhance the DNA yield from the stamp bags.

This additional step provided samples that, when concentrated, produced viable DNA concentrations, some over the optimal 1ng for the ampFISTER® Identifiler® Plus PCR Amplification Kit protocol. Full profiles were found for several of the samples. This research is important because there are an increasing number of drug-related deaths and the person(s) making or delivering the product is left unpunished. If a full profile of the dealer or distributor can be determined, it is possible to target and reduce the places and sales of heroin and thus the amount of heroin overdoses per year.

DNA Yield, Drug, Stamp Bag