



A52 Chapped, Pale Lips? Just Shimmer!

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After attending this presentation, attendees will learn to use methodology which optimizes the yield of DNA. DNA analysts will learn that it is now possible to obtain DNA profiles from objects such as lipstick or chap sticks.

This presentation will impact the forensic science community by allowing analysis of touch evidence by LCN methodology.

The goal of this research was to obtain DNA profiles from different types of touch evidence samples such as lipstick, lip gloss, lip shimmer and other similar items that are normally used on human lips. The present research involved objects used by several male and female donors. The surface of each sample which came in direct contact with the lips was swabbed with the tip of a sterile cotton swab. The tip of each swab was cut and extracted using a modified extraction procedure. This modified method of extraction is used when the amount of template DNA is lower than the amount normally needed (approximately 0.3 to 0.5ng/ μ l) to obtain a full STR DNA profile upon amplification. The assay included cell lysis in a buffer containing 0.01% SDS and Proteinase K.

Some of the samples were also extracted using a robotic system. This automated instrument and the reagents in the provided extraction kit use magnetic bead technology and a silica-based purification system. These samples were subsequently subjected to the modified extraction procedure. All of the extracted DNA samples were purified and concentrated using a filtration method. After the concentration was completed by the filtration method each DNA sample was eluted from the membrane with 10 μ l of the TE⁻⁴ buffer.

The eluted DNA was quantified using a DNA quantitation kit and a Real Time PCR System. The lowest amount of DNA detected from these samples was 0.0009ng/ μ l. Human DNA was also detected from a make-up brush that was used to apply lip gloss on the lips of a female donor. The quantified DNA was amplified using a reduced amplification volume and higher PCR cycle numbers using primers contained in commercially available autosomal and Y-STR kits. After amplification, samples were injected on a 3130xl Genetic Analyzer to generate DNA profiles. The data was analyzed using DNA analysis software.

The reference samples from the donors of the objects were also collected and extracted using a conventional DNA extraction method. These reference samples were amplified using the recommended amplification cycle and the same amplification kits. The samples were injected and analyzed using the same instrument and the same software.

Complete STR DNA profiles were observed when the extracted DNA from the items that touched the lips of the donors was amplified at 34 cycles. A partial DNA profile was obtained from a sample with less than 0.0009ng/ μ l of DNA. STR DNA profiles obtained from these lipstick sample and similar items were consistent with profiles generated from the donors' reference samples.

Given these results, when evidence samples are limited in size, an analyst may confirm the identity of the body fluid donor. This method thus can be used where the victim or the suspect is missing or the body fluid from the victim or the suspect is no longer available for DNA analysis. In these circumstances, lipsticks or similar objects may be the only available evidence. Obtaining DNA profiles from these types of evidence can help in the investigation of the crime and aid in the identification of a missing person.

DNA, STR DNA, LCN