A69 Quantification of Nuclear DNA Obtained From Hairs Based on Root Appearance

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After attending this presentation, attendees will understand the macroscopic and microscopic assessment of hairs to determine suitability for nuclear DNA, and nuclear DNA preparation, extraction, and profiling of hairs.

This presentation will impact the forensic science community by aiding forensic examiners in the isolation of hairs best suited for nuclear DNA analysis, by more thoroughly exploring of the appearance of the root ends of hair and the correlation to the amount of DNA obtained.

This paper, by more thoroughly exploring of the appearance of the root ends of hair and the correlation to the amount of DNA obtained, will aid forensic examiners in the isolation of hairs best suited for nuclear DNA analysis.

Hairs in forensic casework are often times analyzed macroscopically and microscopically prior to nuclear DNA analysis. This is done to determine suitability of these hairs for nuclear DNA analysis. A more through exploration of the appearance of the root ends of hair and how that correlates to the amount of DNA obtained would aid forensic examiners in determining those hairs that are the best suited for nuclear DNA analysis. In this paper, casework results from hairs whose root ends were examined both visually, and tested for nuclear DNA were examined. During the visual exam, hairs were mounted in Permount, photographed, removed from the slides, and rinsed with xylenes. Then they were washed prior to DNA testing, extracted using a SEB, DTT, and Prok extraction buffer, quantitated using Quantifiler, amplified using Identifiler, and run on the genetic analyzer to see if any nuclear DNA result s were obtained. The root appearance was divided into six categories, anagen roots with no tissue, anagen roots with tissue, telogen/catagen roots with much tissue, telogen/catagen roots with moderate tissue, telogen roots with slight tissue, and telogen roots with very slight tissue. These results were analyzed to determine what percentage of full, partial, and no profiles were produced by each root type. These results will show which hair roots are the best for nuclear DNA testing and which hairs may be better suited for mitochondrial or other forms low quantity DNA testing.

Findings of this study, including the possible impact of future nuclear DNA testing on hair, other factors to consider with these results, and future research to explore these factors further will be discussed.

Hair, Root, DNA

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