A124 Comparative Analysis of Quantifiler® Duo and Plexor®HY DNA Quantification Systems

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The goal of this presentation is to educate attendees on the similarities and differences between Quantifiler® Duo, and Plexor®HY DNA quantification systems. In addition attendees will be informed of special characteristics unique to each system of which the attendees should be aware.

This presentation will impact the forensic science community by allowing laboratories to view a side-by-side comparison of the included system or systems and decide which will best meet their needs for specific tasks they may have.

A comparative analysis of Quantifiler® Duo and Plexor®HY DNA quantification systems was conducted to assist forensic laboratories in choosing the DNA quantification method that best suits the needs of their lab as well as some potential outcomes and consequences of choosing each system.

Quantifiler® Duo is a DNA quantification system manufactured by Applied Biosystems and is capable of simultaneously quantifying both total human and human male DNA present in an extracted sample. Quantification was carried out via Real-Time PCR and data analysis was completed in Sequence Detection System software v1.2.3. The human DNA target is Ribonuclease P RNA Component H1 and the human male DNA target is the Sex Determining Region of the Y chromosome. An increased fluorescence of the solution correlates directly with DNA concentration in this system.

Plexor®HY is a DNA quantification system manufactured by Promega Corporation and is capable of simultaneously quantifying both

total human and human male DNA present in an extracted sample. Quantification was carried out via Real-Time PCR and data was analyzed in Plexor® Analysis Software v1.5.4.18 for analysis. The human DNA target is on chromosome 17 and the human male DNA target is on the Y chromosome. A decrease in fluorescence of the solution correlates directly with DNA concentration in this system.

The systems analyzed in the study were internally validated. Studies completed with each system include standard curve quality metrics, sensitivity, precision, reproducibility, contamination, and mixture analysis. The results of the internal validation studies from both systems were compiled and analyzed for comparison.

The standard curves quality metrics study assessed the slope, Y- intercept, and R^2 values of the standard curves generated during data analysis and their correlation to final sample quantity. The sensitivity study assessed the sensitivity of the systems by reviewing quantification data from a range of dilutions with known DNA quantities. A log-linear relationship was expected between the C_T and quantification values.

This relationship was used to establish the limit of detection for the

quantification system. The precision study assessed the precision of the systems through analysis of known standard quantification data generated. The reproducibility study assessed the reproducibility of the concentration data for various samples after repeating the quantification assay multiple times with those samples. The contamination study checked for the presence of contaminant DNA in negative control samples and demonstrate the levels at which contaminant DNA can be detected. The mixture study assessed the ability of the systems to discern male from female DNA in simulated mixtures. **DNA Quantification, Comparison, Validation Studies**

 ** Presenting Author*