CUPCAKE WARS QPCR STYLE: A BAKE-OFF COMPARING QUANTITATION CHEMISTRY FOR Y-SCREENING AND FORENSIC WORKFLOW

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The latest generation of quantitation chemistry has been released this past year with potentially improved sensitivity, reproducibility and improved accuracy in ratios between primer targets. Three multiplex DNA quantification chemistries (Thermo Fisher's Quantifiler® Trio, Promega's Plexor® HY, and Qiagen's QuantiPlex HY-Res) were "baked" in an ABI 7500 to assess their performance relating to viability as a possible screening tool for male DNA prior to full sample selection and STR analysis., In order to accomplish this assessment, the overall kit performance sensitivities were compared for all kits. In addition, an examination of low template detection and confidence in absolute zero results for both autosomal and male specific detection targets was evaluated. Once the comparison data were generated and analyzed, the winning "cupcake" (qPCR chemistry) selected was then utilized in a full case work forensic laboratory validation for both quantification and Y-screening purposes.

Although the invested time took longer than a 1 hour reality t.v. show required for a Food Network bake off, Thermo Fisher's Quantifiler® Trio quantitation chemistry was eventually chosen for the full chemistry validation designed to follow SWGDAM guidelines and FBI QAS. The standard required studies were performed along with several studies specifically designed around Y-screening workflow that included Chelex extraction. There were a few recent challenges in results specific to Y-screening that required some troubleshooting and adjustments to be made once the qPCR chemistry was brought online, but overall, the new generation of quantitation systems have been a pleasant improvement over past performances in forensic casework workflow along with the improvements utilizing Y-screening techniques.