

EVALUATION AND COMPARISON OF POWERPLEX® 16HS FOR USE IN FORENSIC LABORATORIES.

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The future of forensic science, and in particular forensic DNA analysis, revolves around the ability to achieve reliable results. Current circumstances require a forensic DNA laboratory to use a small amount of starting material; in some instances as low as trace amounts of starting material. An existing method for STR typing is to couple two manufacturers' amplification kits in order to ascertain allele calls at the 13 core CODIS loci. This coupled amplification kit approach is not only time consuming, it also consumes twice the extract volume and uses three times the reagents as apposed to a single 25µl reaction kit. A plausible solution is to utilize a manufacturer's single amplification kit that would amplify all 13 core CODIS loci with some additional loci to give additional allelic information.

In this presentation Promega's PowerPlex® 16HS kit and Applied Biosystems' Profiler Plus® and COfiler® kits were compared. These kits were compared using a multifaceted approach. The sensitivity, specificity, precision and accuracy of each kit was evaluated, as well as the capability to amplify challenging and mock casework samples. Additionally, Promega's PowerPlex® 16HS kit was compared to other single amplification kits such as Applied Biosystems' Minifiler® kit and Applied BioSystems' Identifiler® kit. The purpose for comparing Promega's PowerPlex® 16HS kit to other commercially available, single amplification kits would be to reduce the amount of commercial kits a laboratory has to purchase, store, QC, train and proficiency test personnel. An added two-fold benefit for using a single amplification kit is that a smaller extract volume can be used, allowing for additional testing, such as Y-STR's and any unforeseen subsequent analysis. Furthermore, a single amplification provides the ability to overcome inhibition in difficult samples. Finally, the switch to a commercially available single amplification kit has the potential to save a large caseload laboratory upwards of fifty thousand dollars or more by eliminating the purchase of additional kits to achieve results for the 13 core CODIS loci.