

POWERPLEX® FUSION VALIDATION, COMPARISON, AND DISCUSSION

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Promega's PowerPlex® Fusion system co-amplifies 24 loci (23 STR loci and Amelogenin); including the CODIS core loci and the European Standard Set (ESS) loci while maintaining a five-color fluorescent detection platform. Validation of Promega's PowerPlex® Fusion multiplex kit included experiments described in Section 8 of *The FBI's Quality Assurance Standards for Forensic Testing Laboratories*. Hence, known and non-probative samples were tested, reproducibility, precision, sensitivity and stochastic experiments conducted, and mixture studies performed. Full profiles (24 loci) were routinely generated from single source DNA template using 31.2pg of DNA. In addition, a cursory comparison of Promega's PowerPlex® Fusion with PowerPlex® HS16 (Promega), Identifier® (Applied Biosystems), and Identifier® Plus (Applied Biosystems) was performed to include efficiency and sensitivity at low level DNA concentrations. In summary, our results demonstrate that the PowerPlex® Fusion system produced more information (24 loci) compared to other human identification systems and is a suitable and compliant replacement system for future CODIS expansion.