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Validation study of GlobalFiler™ PCR amplification kit and PowerPlex® fusion system for 24 STR loci and Y indel

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Short Tandem Repeats (STRs) are the most powerful tools for human identification in the field of forensic genetics. Recently, the multiplex GlobalFiler™ PCR Amplification kit (Applied Biosystems) and PowerPlex® Fusion system (Promega) were released with 24 loci, including the CODIS core, the European Standard Set and additional male-specific markers. In Korea, a DNA database has been constructed based on 13 STR CODIS core loci, and we are aiming to expand the number of testable STR loci in accordance with the expanded CODIS core loci. Therefore, in this study, we estimated the performance of the GlobalFiler™ PCR Amplification kit and PowerPlex® Fusion system for application of the expanded STR loci for DNA database generation and forensic casework analysis. For the validation, we performed five experiments, including sensitivity, stochastic, scale-down, inhibitor, and mixture studies, and compared the results of both multiplex kits. Five genotyping discrepancies between the GlobalFiler™ PCR Amplification kit and PowerPlex® Fusion system were observed due to allelic drop-out (null alleles) or microvariants. With the expanded markers, both new kits were shown to provide robust genetic information and are suitable tools for DNA database and forensic analyses, such as human identity and parentage testing.

Biography

Jin Myung Lee has completed her Master's degree from The Catholic University of Korea. She is the researcher of National Forensic Service at Forensic DNA Division. She has published more than 10 papers in reputed journals.

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