

STUDIES OF APPLICATIONS FOR POWERPLEX® 16 BY THE EASTERN EUROPEAN STR WORKING GROUP

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Promega constituted the European STR Working Group with the initial goal of validating PowerPlex® for use in forensic and paternity work. This Working Group is divided into working sub groups and the results presented herein represent the portion of study made by the DNA laboratory of the Institute of Criminalistics Prague, Czech Republic.

The studies of applications for PowerPlex® 16 performed were focused on processing of Low Copy Number DNA samples, testing the use of FTA® paper and PCR amplification of mammal DNA.

Low copy number (LCN) DNA profiling is a technique enabling us to analyze minute amounts of DNA. The LCN samples (urine, latent fingerprints, strangulation tools, epithelia cells on textile) were tested with the focus on extraction (effect of carrier DNA), PCR conditions, and evaluation and interpretation of results. The sensitivity of PowerPlex® 16 System helps to obtain DNA profile without dramatically increased the cycle number. Low artifact production and PENTA systems providing an ideal tool for evaluation of DNA mixtures make PowerPlex® 16 an ideal system for LCN samples processing.

The FTA® paper is a safe and convenient system for collecting, transporting, and storing blood and other biological specimens, and the subsequent purification of genomic DNA from stored specimens. We tested the peak height across loci, presence of non-specific bands, stutters, sample-to-sample consistency, and preferential amplification of the DNA bound on the FTA® paper and processed using the PowerPlex® 16 System. The result of this study is the optimized protocol for PowerPlex® 16 System (DNA amount, reaction volume, PCR conditions).

PCR amplification products of mammal DNA, with a special focus on the primates DNA, were tested as a part of PowerPlex® 16 validation study. DNA samples from four non-human primates (chimpanzee, macaque, gorilla and orangutan) generated peaks in up to 14 microsatellite loci. The results suggest that PowerPlex® 16 can be successfully used even for paternity assignments in non-human primates.