EVALUATION AND COMPARISON OF THE QUALITY OF STR PROFILES GENERATED BY MODIFIED RAPID DNA SYSTEMS

Tetsushi KITAYAMA, Kazumasa SEKIGUCHI

National Research Institute of Police Science

This study is aimed to evaluate and compare the quality of STR profiles generated by modified rapid DNA systems which is integrated and automated system to process forensic DNA samples to DNA profiles. Modified PowerPlex® Fusion 6C assay on DNAscan 6C Rapid DNA Analysis System and GlobalFiler Express assay on the RapidHIT Human DNA Identification System are capable of automated STR typing for the 20 required CODIS loci and other additional loci.

In this experiment, not only buccal swabs but also mocked evidence samples such as bloodstains and saliva stains were collected and processed. Here we present the results of comparison of two modified rapid DNA systems in terms of reproducibility and contamination, sensitivity and stochastic, and mixture studies. In addition, we present the success rates with and without manual review using the expert systems of the STR profiles obtained from rapid DNA systems. We also present the result of compatibility study of the quality and concordance of STR profiles generated by modified rapid DNA systems and conventional capillary electrophoresis system. The liquid STR premix on DNAscan 6C Rapid DNA Analysis System is improved recently, so here we also present the comparison of intra- and inter-loci balance and the results of concordance study.