

Automated Processing of the GlobalFiler® Express PCR Amplification Kit With the Formulatrix Mantis

Introduction

Accurate and rapid processing of blood or buccal samples collected via swab and paper substrates is critical to the efficient operation of forensic laboratories. The Global Filer® Express Kit* is an STR multiplex assay enabling direct amplification from reference samples including swabs and paper punches. This application note describes the use of the Formulatrix Mantis to dispense the Global Filer® Express Kit master mix to the amplification plate with treated buccal punches present.

Materials and Methods

The 1.2 mm treated paper disks with sample were added to the required number of wells prior to the addition of GlobalFiler® Express Kit reagents. The GlobalFiler® Express Kit reagents were processed according to the vendor's instructions for 26 cycle treated paper direct amplification.

In brief, the master mix was prepared by combining the following volumes per sample: 6.0 µL master mix, 6.0 µL primer set, and 3.0 µL low-TE buffer. The Mantis liquid handler (Figure 1) was used to dispense 15 µL master mix to the MicroAmp® Optical 96-Well Reaction Plate. The subsequent amplification products were run on an Applied Biosystems 3500xl Genetic Analyzer and analyzed with GeneMapper® ID-X v1 .4 software**.



Figure 1. Mantis Liquid Handler

Results

Out of the 17 treated buccal punches tested, all 17 generated full profiles using a 26 cycle PCR amplification (Figure 2). All amplification controls (two positive and two negative controls) generated expected results, as well.

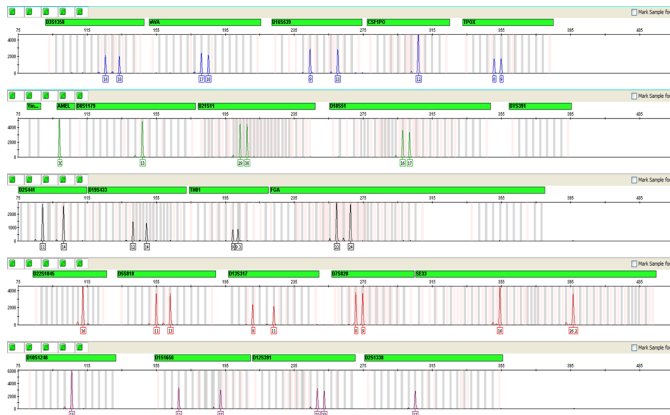


Figure 2. Profile generated from a treated buccal punch using GlobalFiler® Express at 26 cycles.

Conclusion

The combination of the Global Filer® Express PCR Amplification Kit and the Formulatrix Mantis liquid handler creates an efficient system for generating profiles. The GlobalFiler® Express chemistry eliminates the need to extract and quantify DNA prior to amplification. The Mantis provides robust and accurate automated dispensing of the Global Filer® Express Master Mix to the amplification plate with minimal dead volume controlled by intuitive software. Integration of an automated punching robot and a LIMS system would provide a complete system for processing paper punches with complete chain of custody. Future studies will include dispensing GlobalFiler® Express PCR Amplification reagents with a newer Mantis that features pressurized bottle dispensing to meet the automation needs of modern forensic laboratories.

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