

HIGH-PERFORMANCE AND LOW-COST AUTOMATED MICRO-CHANNEL ELECTROPHORESIS SYSTEM FOR HUMAN DNA TYPING

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Currently, electrophoresis tools for human DNA typing in the laboratories utilize slab-gel electrophoresis technologies and/or multi-capillaries DNA sequencing apparatus. They are either labor intensive or expensive. In this report, we demonstrate a portable and bench type micro-channel electrophoresis system for a high efficiency human DNA typing. The processes of sample loading, electrophoresis and data analysis are automatic. Twelve DNA samples can be analyzed simultaneously by using a multiple usage micro-channel cartridge. The digital data results of 12 individual DNA samples can be obtained within 10 minutes, either in the format of electropherogram or a conventional slab gel view. The resolving power reaches 4 bp in the STR DNA analysis. The capacity of this system can hold the total of 96 samples in a 96-well PCR plates, which can be automatically analyzed within 1.3 hours. This affordable system can be used in the forensic laboratories for human DNA typing.