

302e Polymeric Microfluidic DNA Analysis System for Forensic DNA Analysis

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We will describe the development of a prototype polymer-based microfluidic system for the rapid, multiplexed analysis of forensic short tandem repeat (STR) DNA samples. The microfluidic system is an eight microfluidic channel system fabricated in commercially available plastic, which decreases the fabrication and materials costs, and increases the future commercial potential of this technology. Since the device cost is low, polymer microfluidic systems can also be employed as single-use devices to prevent issues of cross-contamination. In this presentation, we will discuss results of DNA separations performed in polymer microfluidic systems emphasizing improvements in performance that have been achieved by altering device design, substrate material, and DNA polymer matrix used for the separation. Other critical aspects of this project that will be discussed include the development of new optical detection systems optimized for DNA detection in polymer devices, testing of new higher performance DNA separation polymer matrices, and surface treatment and passivation to enable high efficiency separations.