Automation for Agilent Microarray-Based Comparative Genomic Hybridization (aCGH) Assays: A Cost-Effective Approach to Increased Sample Throughput and Reliability

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Microarray-based comparative genomic hybridization (aCGH), also known as chromosomal microarray analysis (CMA), is a critical tool used in Clinical Diagnostics to detect large deletions and duplications within the genome that are correlated with genetic diseases. We have developed an automated high-throughput cost-effective protocol that improves overall assay reliability and allows for assay miniaturization. Automation of this process allows for improved sample traceability and integrity, dynamic handling of multiple assay panels, and increased sample throughput by four fold at a fraction of the cost compared to manual processing. The Derivative Log Ratio (DLR) spread is used as a measure of array quality with values <0.20 considered as passing. Implementing automation for the aCGH process increased run to run consistency, increased per run processing by a minimum of 4X per technician a day, as well as decreased assay cost by approximately 55% with respect to manual aCGH procedures. This demonstrates how automation enables a rapid, cost-efficient, robust, and high-quality approach to aCGH processing that is essential to ensure sample tractability and integrity in a high-throughput environment.

Automation and High-Throughput Technologies Track
Poster Presentation