

THE USE OF DNA MICROCHIPS IN AN AUTOMATED SYSTEM FOR STR ANALYSIS

Ronald G. Sosnowski, Ray Radtkey, Lana Feng, David Canter, Dana Vollmer and Michael Nerenberg

Nanogen, Inc., San Diego, CA



We are developing a DNA-chip based integrated microelectronic system to carry out rapid multiplex hybridization analysis, site independent electronic stringency and detection. This platform technology is being developed for both diagnostic and research applications. The research system will permit on-site loading of investigative reagents for production of custom DNA-chips.

Rapid point mutation and single base discrimination analyses have been carried out for several loci in areas relevant to cancer, genetic disease, and functional genomics. We have also developed hybridization assays providing allelic discrimination of STR loci for the application of human identification. In addition to speed, sensitivity and selectivity, this technology provides two other significant advantages for hybridization analysis. The first is electronic stringency, which allows discrimination analysis to be carried out rapidly and accurately. Second, our technology allows analysis of samples (such as PCR amplicons) containing substantially double-stranded DNA targets. We have sought to provide a technological platform that is flexible and therefore amenable to the general analysis of genetic polymorphism. We are also developing point-of-use systems that may have value in the field of forensic human identification.