

Production Scale Genotyping and Gene Expression Analysis Using The Illumina BeadArray[®] System

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Illumina has developed the BeadStation 500, a flexible genotyping and gene expression system based on miniaturized arrays of assay beads. The arrays are formatted into either 16-sample BeadChips or Array Matrices that match a 96-well microtiter plate, allowing samples to be processed in parallel using a manual protocol or conventional robotic automation. The BeadStation 500 can generate as few as 6,000 to as many as 300,000 genotypes per day. It is an ideal platform for environments where project size and frequency vary. The system generates highly accurate genotype calls (both heritability and reproducibility rates above 99.95%) and automatic quantitative quality scores. Illumina has also adopted the BeadStation and BeadArray technology for use in gene expression profiling. Using the same Array of Arrays format and fundamental system components, expression arrays are made using beads with covalently bound 50mer gene-specific oligo probes. The arrays demonstrate outstanding assay performance and are fully customizable, allowing researchers to design their own focused sets in the range of 200-1,400 genes. With the Sentrix Array Matrix format, 96 samples can be studied at once, allowing experimentation at a substantially higher sample throughput