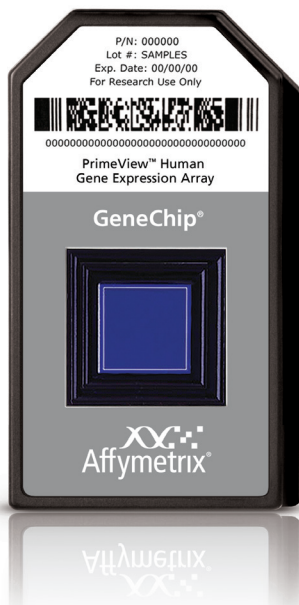# Data Sheet

GeneChip® PrimeView™ Human Gene Expression Array

Industry leading technology for cost-effective expression profiling

The GeneChip® PrimeView™ Human Gene Expression Array provides comprehensive coverage of the human genome in a cartridge array format designed for use with the GeneChip® Scanner 3000 7G series.

Introduction

The PrimeView™ Human Gene Expression Array offers the industry's highest quality expression technology in a cartridge format, enabling comprehensive whole-genome gene expression analysis. The array demonstrates extremely high performance, with strong signal and fold change correlation between sample replicates; it is a powerful and cost-effective tool for studying drug and disease regulatory mechanisms.

Key benefits of the PrimeView™ Array:

- **Offers excellent gene expression specificity and reproducibility**

- **Produces reliable results with multiple independent measurements per transcript—11 probes per set for well-annotated sequences, 9 probes per set for the remainder**

- **Provides complete coverage of the annotated genome**
  - **Highest transcript coverage in the industry with the most recent annotation—covers all well-annotated genes and transcripts from RefSeq**

Design and coverage

The PrimeView™ Array utilizes content with an emphasis on established, well-annotated genes. The array is for use with the GeneChip® Scanner 3000 7G (GCS 3000 7G) and is supported by our premium reagents and software. The PrimeView Array, which is a perfect-match-only (PM) array, yields data that is not directly comparable with previous arrays, including the GeneChip® Human Genome U133 (HG-U133) Array or the GeneChip® Human Gene 1.0 ST Array.

Table 1 lists the key data sources used to design the probes and associated analysis files that contain the gene annotation for each set of probes. Affymetrix frequently updates array annotation files to remain up to date with the current understanding of each genome. Please visit the Affymetrix website for the most recent array annotation available.

Table 1: Annotation and key data sources for PrimeView Human Gene Expression Array.

Data sources (June 2011)	PrimeView
UniGene (design time)	219
RefSeq	41
NCBI genome version	37
UCSC	19
Ensembl	57
GenBank®	177
Entrez	6/2010

Performance

Figure 1 and Table 3 show that the PrimeView Array demonstrates the same high level of performance as other 3' gene expression analysis arrays. Affymetrix observed a median coefficient of variation (CV) of less than 10 percent. The Pearson correlation coefficient for sample replicates was greater than 0.990.

Hybridization targets were prepared from Microarray Quality Control (MAQC) A and B total RNA and HeLa (Table 2) using the GeneChip® 3' IVT Express Kit. Labeled target from each sample was pooled and hybridized to the arrays. CEL files were quantile normalized with Expression Console™ Software using the RMA algorithm for probe set summarization.

Figure 1: Signal correlation. Scatter plots of RMA probe set signal comparing replicate hybridizations of MAQC A (A), MAQC B (B), and HeLa C (C) samples. The Pearson correlation coefficient (R) is calculated for each comparison. All probe sets were used in the comparison.
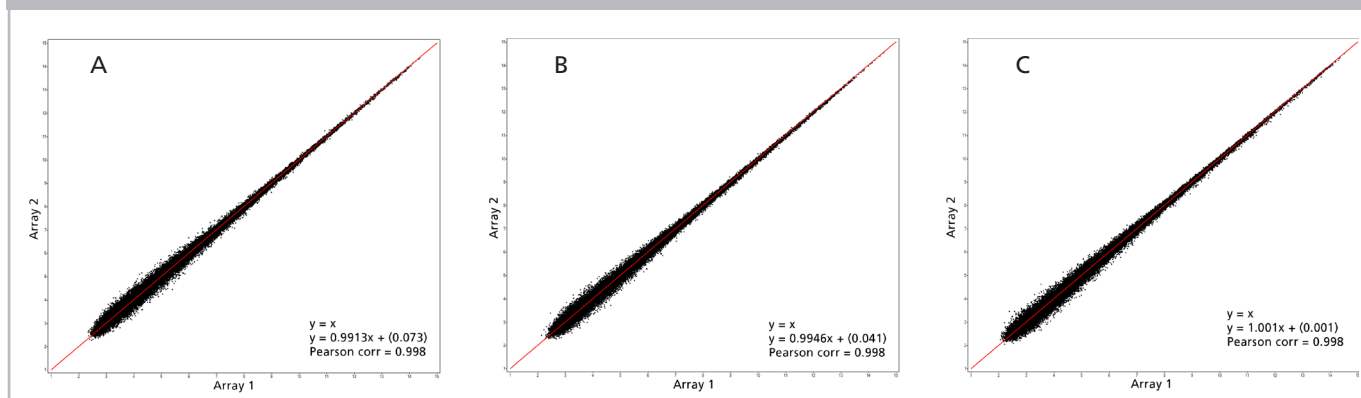
Table 2: Total RNA samples used in the study.

RNA	Description	Supplier	Part number
MAQC A	Universal Human Reference RNA	Stratagene®	740000
MAQC B	Human Brain Reference RNA	Ambion®	AM6050; AM6051; AM6052
HeLa	Cervical Adenocarcinoma (HeLa-S3)	Ambion®	AM7852

Table 3: Replicate hybridization CV. Pooled, labeled target from MAQC A, MAQC B and HeLa was hybridized in quadruplicate to PrimeView™ Arrays. RMA signal was converted from log to linear scale and the CV for each probe set was calculated from all replicates (N = 4). The median CV for all probe sets was then calculated.

No. of replicates	MAQC A	MAQC B	HeLa
4	5.8%	6.1%	6.1%

Array content

RefSeq probe sets	PrimeView™ Array
RefSeq probe sets (total)	48,658
UniGene probe sets not covered by RefSeq probe sets	419
Other probe sets (controls and other sequence sources)	318
Total probe sets	**49,395**
Control probe sets	
Poly-A controls	*dap, lys, phe, thr*
Hybridization controls	*bioB, bioC, bioD, cre*
Housekeeping/control genes	GAPDH, beta-actin
Normalization controls	100 probe sets

Specifications

Input RNA required	50–500 ng
Sensitivity[1]	≥1:100,000
Detectable fold change	≥2.0 fold
Dynamic range[1]	≥3log
Probe length	25-mer

[1] Sensitivity and dynamic range were determined using a Latin square experimental design with 61 in vitro transcribed (IVT), full-length transcripts added to HeLa total RNA. For this experiment, 12 spike pools with different relative abundances were tested. Spike concentration differences were defined as significant if the t-statistic results were greater than a threshold set based on three replicates and the alpha significance level of 0.95.

Ordering information

Part number	Product	Description
901837	GeneChip® PrimeView™ Human Gene Expression Array	Contains 10 arrays
901838	GeneChip® PrimeView™ Human Gene Expression Array	Contains 30 arrays
901839	GeneChip® PrimeView™ Human Gene Expression Array and 3' IVT Express Kit Bundle	Sufficient for 10 reactions
901840	GeneChip® PrimeView™ Human Gene Expression Array and 3' IVT Express Kit Bundle	Sufficient for 30 reactions

Related products

Part number	Product	Description
901228	GeneChip® 3' IVT Express Kit	Sufficient for 10 reactions (manual preparation)
901229	GeneChip® 3' IVT Express Kit	Sufficient for 30 reactions (manual preparation)
900720	GeneChip® Hybridization, Wash, and Stain Kit	Sufficient for 30 reactions

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