

## GeneChip® Human Gene 2.0 ST Array Affymetrix® Human Gene 2.1 ST Array Strip Affymetrix® Human Gene 2.1 ST Array Plate

**A whole-transcript design for the most comprehensive and accurate gene-level view of coding and long non-coding transcripts**

Keeping pace with the research community's understanding of the transcriptome, Affymetrix has designed a whole-transcript array that includes probes to measure both messenger (mRNA) and long intergenic non-coding RNA transcripts (lincRNA).

This whole-transcript array design provides a complete expression profile of mRNA as well as a comprehensive view of the intermediary lincRNA that impact the mRNA expression profile.

Research over the past 20 years has predominantly focused on protein coding messenger RNA transcripts and their role in cellular processes, such as disease and development. Recently researchers have identified more than 10,000 transcripts (>200 bases) with little or no protein coding potential. Only a small fraction of these non-coding RNAs has functional annotations to date.

There is, however, ample evidence that lincRNA play an important role in the genesis and progression of diseases, including cancer. Recent advancements in transcriptome profiling provided evidence of the association of lincRNAs in a diverse range of cellular functions such as:

- Regulation of mRNA transcription and transcriptional modifications
- Occlusion/recruitment of transcription factor binding
- Activation and transportation of transcription factors
- Interaction with accessory proteins

Benefits of these arrays are:

- Comprehensive transcriptome coverage provides the best opportunity to discover interesting biology:
  - >33,500 coding transcripts
  - >11,000 long intergenic non-coding transcripts
- Measure alternative splicing events/transcript variants with probes designed to maximize coverage of exons
- Reproducible: signal correlation coefficient  $\geq 0.99$

### Array design strategy and coverage

These expression arrays are designed to provide extremely high coverage of the transcribed genome. We have used a comprehensive collection of information sources to design probes to interrogate multiple loci on every exon of every transcript.

These expression arrays have been designed with a median of 21 unique probes per transcript. Each unique probe is 25 bases in length, which means that the array measures a median of 525 bases per transcript.

This design strategy provides you with the ability to evaluate whole-transcriptome gene expression at the gene and exon levels, which allows the study of transcript variants and alternative splicing events.

This high coverage across the entire transcript results in superior performance and data confidence.

### Specifications

Transcript coverage of the array	
NM and XM – RefSeq coding transcript, well-established and provisional annotations	>33,500
NR and XR – RefSeq non-coding transcript, well-established and provisional annotations	>6,500
Total RefSeq transcripts	>40,000
RS (Entrez) gene count	>25,000
lincRNA transcripts <sup>1</sup>	>11,000

<sup>1</sup> Derived from the Broad Institute's Human Body Map lincRNAs and TUCP (transcripts of uncertain coding potential) catalog and lincRNA db

Detailed information on content of this array can be obtained on NetAffx using the Expression Array Comparison tool (<http://www.affymetrix.com/analysis/compare/index.affx>). Please note that you will need to log on to [www.affymetrix.com](http://www.affymetrix.com) to access this content.

Data sources used to design the array	
RefSeq (release 51)	
Ensembl (release 65)	
lncRNA db	
Broad Institute, Human Body Map lincRNAs and TUCP (transcripts of uncertain coding potential) catalog	

Performance specifications	
Sensitivity <sup>1</sup>	≥1:100,000 (≥1.5 pM)
Signal correlation coefficient	≥0.99
Detectable fold change <sup>1</sup>	2-fold for 1:100,000 vs 1:50,000
Dynamic range	~3 logs

<sup>1</sup> Sensitivity and dynamic range were determined using a Latin square experimental design with 61 full-length, *in vitro* transcribed RNAs spiked into HeLa total RNA. For this experiment, four samples comprising four different relative abundances were tested. Sensitivity to detect a 2-fold change was defined as significant based on a t-statistic meeting a threshold set for three replicates and 95% confidence.

Array design	
Total probes	>1.35 million
Exon-level probe sets	>418,000
Gene-level probe sets	>48,000
ERCC probe sets <sup>1</sup>	92
Background probes	Antigenomic set
Poly-A controls	<i>dap, lys, phe, thr</i>
Hybridization controls	<i>bioB, bioc, bioD, creX</i>
Total RNA input required	50–500 ng
Probe feature size	5 µm
Probe length	25-mer
Probes per gene (median)	21
Target RNA orientation	Sense target

<sup>1</sup> Probe sets interrogating external RNA controls present in the Ambion® ERCC RNA Spike-In Control Mixes, P/N 4456740 and 445673

## Ordering information

Part number	Description	Details
902458	GeneChip® Human Gene 2.0 ST Array and GeneChip® WT PLUS Reagent Kit	Sufficient for 10 samples
902459	GeneChip® Human Gene 2.0 ST Array and GeneChip® WT PLUS Reagent Kit	Sufficient for 30 samples
902476	GeneChip® Human Gene 2.0 ST Array and SensationPlus™ FFPE Amplification and WT Labeling Kit	Sufficient for 12 samples
902477	GeneChip® Human Gene 2.0 ST Array and SensationPlus™ FFPE Amplification and WT Labeling Kit	Sufficient for 24 samples
902114	Affymetrix® Human Gene 2.1 ST Array Strip	Contains one 4-array strip
902136	Affymetrix® Human Gene 2.1 ST 16-Array Plate and Trays	Contains one 16-array plate
902137	Affymetrix® Human Gene 2.1 ST 24-Array Plate and Trays	Contains one 24-array plate
902138	Affymetrix® Human Gene 2.1 ST 96-Array Plate and Trays	Contains one 96-array plate

## Related products

Part number	Description	Details
902280	GeneChip® WT Plus Reagent Kit	Sufficient for 10 reactions
902281	GeneChip® WT Plus Reagent Kit	Sufficient for 30 reactions (manual) or 24 reactions (automated)
902414	GeneChip® HT WT Plus Reagent Kit	Sufficient for 96 reactions
900720	GeneChip® Hybridization, Wash, and Stain Kit	Sufficient for 30 reactions
901667	GeneAtlas® Hybridization, Wash, and Stain Kit for WT Array Strips	Sufficient for 60 reactions
901622	GeneTitan® Hybridization, Wash, and Stain Kit for WT Array Plates	Sufficient for 96 reactions

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