



# Data Sheet

## GeneChip® Rat Genome 230 Arrays

The GeneChip® Rat Genome 230 Arrays (Rat Expression Set 230 and Rat Genome 230 2.0 Array) provide the most comprehensive coverage of the rat genome in multiple array formats to meet your specific research requirements. The GeneChip Rat Genome 230 2.0 Array is the first whole-genome array to interrogate over 30,000 transcripts and variants from the rat genome, including over 28,000 well-substantiated rat genes. The GeneChip Rat Expression Set 230 provides complete coverage of the rat genome on two arrays.

Both the GeneChip Rat Genome 230 2.0 Array and the GeneChip Rat Expression Set 230 are powerful tools for toxicology, neurobiology, and other applications using rat as a model organism.

**Power of the Probe Set** — The key advantage of GeneChip technology is that each high-density array contains multiple probe pairs per probe set, providing several independent measurements from every transcript.

### Applications

The rat is a principal model organism for studying human health and disease. In some cases, it is the animal most similar to humans for specific pathways relevant to human biology. As a result, the rat plays a key role in toxicology as well as in physiological studies related to cardiac and vascular function, pulmonary circulation, metabolism, neurological control, age- and gender-related differences, and studies related to hypertension and signal transduction<sup>1</sup>.

The GeneChip® Rat Genome 230 2.0 Array provides the entire transcribed rat genome on a single array. This enables scientists to obtain the most comprehensive view of the transcribed rat genome in order to make accurate biological conclusions. GeneChip Rat Genome 230 2.0 and Rat Expression Set 230 arrays have been used extensively for a wide variety of applications including the discovery of new target genes involved in cardiac ischemia, global analysis of gene expression in skeletal muscular activity, transcriptional profiling of liver disease, and analysis of signaling pathways related to metabolism and development. The tremendous amount of information garnered from GeneChip brand microarrays provides the data necessary to

build extensive quantitative databases which are important tools for toxicology studies and clinical development.

<sup>1</sup>National Center for Biotechnology Information

### GeneChip® Rat Genome 230 2.0 Array

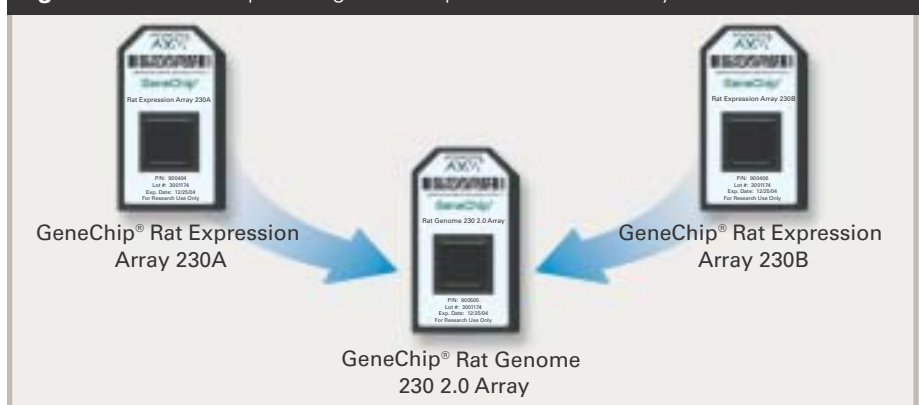
The GeneChip Rat Genome 230 2.0 Array is the first single array to provide comprehensive coverage of the transcribed rat genome.

- Provide comprehensive coverage of the transcribed rat genome
- 31,000 probe sets analyze the expression level of over 30,000 transcripts and variants from over 28,000 well-substantiated rat genes
- The publicly available draft of the rat genome and leading public rat databases were used to refine sequences and provide a higher quality of data output
- Sophisticated bioinformatics tools available through the NetAffx™ Analysis Center to rapidly obtain biologically meaningful results

### ARRAY PROFILE

All probe sets represented on the GeneChip Rat Expression Set 230 are included on the GeneChip Rat Genome 230 2.0 Array.

**Figure 1.** Relationship Among GeneChip® Rat Genome Arrays



Sequences used in the design of the GeneChip Rat Genome 230 2.0 Array were selected from GenBank®, dbEST, and RefSeq. The sequence clusters were created from the UniGene database (Build 99, June 2002) and then refined by analysis and comparison with the publicly available draft assembly of the rat genome from the Baylor College of Medicine Human Genome Sequencing Center (June 2002).

The GeneChip Rat Genome 230 2.0 Array includes representation of the RefSeq database sequences and probe sets related to sequences and refined EST clusters previously represented on the GeneChip Rat Genome U34 Set.

Oligonucleotide probes complementary to each corresponding sequence are synthesized *in situ* on the arrays. Eleven pairs of oligonucleotide probes are used to measure the level of transcription of each sequence represented on the GeneChip Rat Genome 230 2.0 Array.

#### INSTRUMENT SOFTWARE REQUIREMENTS

- GeneChip® Scanner 3000, enabled for High-Resolution Scanning\*
- GeneChip® Operating Software (GCOS) v1.1.1, which contains the High-Resolution Scanning Update.

\* GeneChip Scanner 3000 High-Resolution Update is standard on all instruments shipped starting in September 2003 with serial number series 502. Previous versions (serial number series 501) will require the 00-0110 GeneChip Scanner 3000 High-Resolution Update to be installed.

## GeneChip® Rat Expression Set 230

The GeneChip Rat Expression Set 230 provides comprehensive coverage of the rat genome on two arrays.

- Provide comprehensive coverage of the transcribed rat genome
- 31,000 probe sets analyze the expression level of over 30,000 transcripts and variants from over 28,000 well-substantiated rat genes
- The publicly available draft of the rat genome and leading public rat databases were used to refine sequences and provide a higher quality of data output
- Sophisticated bioinformatics tools available through the NetAffx™ Analysis Center to rapidly obtain biologically meaningful results

#### ARRAY PROFILE

Sequences used in the design of the GeneChip Rat Expression Set 230 were selected from GenBank®, dbEST, and RefSeq. The sequence clusters were created from the UniGene database (Build 99, June 2002) and then refined by analysis and comparison with the publicly available draft assembly of the rat genome from the Baylor College of Medicine Human Genome Sequencing Center (June 2002).

The GeneChip Rat Expression Set 230 includes representation of the RefSeq database sequences and probe sets related to sequences and refined EST clusters previously represented on the GeneChip Rat Genome U34 Set.

Oligonucleotide probes complementary to each corresponding sequence are synthesized *in situ* on the arrays. Eleven pairs of oligonucleotide probes are used to measure the level of transcription of each sequence represented on the GeneChip Rat Expression Set 230.

## Normalization Controls<sup>2</sup>

All GeneChip Rat Genome 230 Arrays include a set of rat maintenance genes to facilitate the normalization and scaling of array experiments. These probe sets are identical on all Rat Genome 230 Arrays and serve as a tool to normalize or scale your data prior to performing data comparison. These normalization genes show consistent levels of expression over defined sample sets.

<sup>2</sup> Affymetrix would like to acknowledge Gene Logic Inc. as the source of information that led Affymetrix to the determination of algorithm used in the selection of the genes included in the Normalization Control Set.

## Relationship to GeneChip Rat Genome U34 Set

Most sequences previously represented on the GeneChip Rat Genome U34A Array are represented on the GeneChip Rat Expression Set 230 and the GeneChip Rat Genome 230 2.0 Array. Due to the dynamic nature of public databases, probe sets for these sequences will not be identical, and, in some cases, will be represented by a completely new probe set. As a result, data generated with different versions of the rat arrays may not always produce concordant results.

#### RELATED PUBLICATIONS

Fischer, M. D. *et al.* Expression profiling reveals metabolic and structural components of extraocular muscles. *Physiol Genomics* **9**(2): 71-84 (2002).

Flamez, Daisy *et al.* Critical Role for Cataplerosis via Citrate in Glucose-Regulated Insulin Release. *Diabetes* **51**(7): 2018-2024 (July 2002).

Grundschober, C. *et al.* Neurosecretion competence: A comprehensive gene expression program identified in PC12 cells. *Bio Chem* (2002).

National Center of Biotechnology Information web page (<http://www.ncbi.nlm.nih.gov/>)

## Critical Specifications for GeneChip® Rat Genome 230 Arrays

	Rat Genome 230 2.0 Array	Rat Expression Set 230
Number of arrays in set	1	2
Number of probe sets	31,042	31,042
Feature size	11 µm	18 µm
Oligonucleotide probe length	25-mer	25-mer
Probe pairs/sequence	11	11
Control sequences included:		
Hybridization controls:	<i>bioB, bioC, bioD, and cre</i>	<i>bioB, bioC, bioD, and cre</i>
Poly-A controls:	<i>dap, lys, phe, and thr</i>	<i>dap, lys, phe, and thr</i>
Normalization control set:	100 probe sets represented	100 probe sets represented on both A and B arrays
Housekeeping/Control genes:	GAPDH, beta-Actin, hexokinase 1	GAPDH, beta-Actin, hexokinase 1
Detection sensitivity	1:100,000*	1:100,000*

\*As measured by detection of pre-labeled transcripts derived from mouse cDNA clones in a complex rat background.

## Supporting Products

Part Number	Product Name	Description
900375	T7-Oligo(dT) promoter Primer Kit	Sufficient for 150 reactions
900431	One-Cycle cDNA Synthesis Kit	Sufficient for 30 reactions
900432	Two-Cycle cDNA Synthesis Kit	Sufficient for 30 two-cycle reactions
900371	GeneChip® Sample Cleanup Module	Sufficient for 30 reactions
900449	GeneChip® Expression 3 -Amplification Reagents for IVT Labeling	Sufficient for 30 reactions
900433	Eukaryotic Poly-A RNA Control Kit	Approximately 100 reactions
900454	Eukaryotic Hybridization Control Kit	Sufficient for 30 reactions
900457	Eukaryotic Hybridization Control Kit	Sufficient for 150 reactions
900301	Control Oligo B2 (included in Hybridization Control Kit)	Sufficient for 30 reactions

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## Ordering Information

### Rat Genome 230 2.0 Array

GeneChip® Rat Genome 230 2.0 Array

- 900505** *Contains 2 Rat Genome 230 2.0 Arrays*
- 900506** *Contains 6 Rat Genome 230 2.0 Arrays*
- 900507** *Contains 30 Rat Genome 230 2.0 Arrays*

### Rat Expression Set 230

GeneChip® Rat Expression Set 230

- 900408** *Contains 5 Rat 230A and 5 Rat 230B Arrays*
- 900442** *Contains 30 Rat 230A and 30 Rat 230B Arrays*

GeneChip® Rat Expression Array 230A

- 900404** *Contains 5 Rat 230A Arrays*
- 900405** *Contains 30 Rat 230A Arrays*

GeneChip® Rat Expression Array 230B

- 900406** *Contains 5 Rat 230B Arrays*
- 900407** *Contains 30 Rat 230B Arrays*

#### To Order

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##### Europe

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##### Japan

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