AFFYMETRIX®

Data Sheet

GeneChip® Rat Genome U34 Arrays

At the time of their release, the GeneChip® Rat Genome Arrays provided comprehensive coverage of the rat genome for toxicity, neurobiology, immunology, and other specific research applications that use the rat as a model system. Newer generation rat arrays are now available. Please visit www.affymetrix.com for a complete listing of products available. Exclusively from Affymetrix, this array family includes:

- GeneChip Rat Genome U34 Set
- GeneChip Rat Toxicology U34 Array
- GeneChip Rat Neurobiology U34 Array

The Rat Genome U34 Set provides gene expression data for more than 24,000 known genes and EST clusters, including 7,000 known genes, which enable you to better understand the molecular mechanisms of phenotypic endpoints. All full-length or annotated genes are located on the A array in this three-array (A, B, C) set as well as all of the probe sets that are also on the GeneChip Rat Toxicology U34 and the GeneChip Rat Neurobiology U34 Arrays. The B and C arrays contain thousands of EST clusters.

The GeneChip Rat Genome Arrays are powerful tools for a wide range of applications including:

- Defining signaling pathways and molecular mechanisms
- Gene discovery
- Improving lead compound discovery
- Defining molecular mechanisms of toxicity
- Studying neurobiological pathways

GeneChip® Rat Genome U34 Set

The GeneChip® Rat Genome U34 Set provides gene expression data for more than 24,000 known genes and EST clusters for comprehensive coverage of the rat genome, at the time of their release. Newer generation rat arrays are now available. Please visit www.affymetrix.com for a complete listing of products available.

Application

The Rat Genome U34 Set is a powerful tool for toxicology, neurobiology, immunology and other specific research applications using the rat as a model system.

DEFINE SIGNALING PATHWAYS AND MOLECULAR MECHANISMS

Evaluate ~ 7,000 known genes to better understand the molecular mechanisms of phenotypic endpoints. Massively parallel expression analysis facilitates the identification of gene associations to define key targets in signaling pathways. All full-length or annotated genes are located on the A array in this three-array (A, B, C) set.

GENE DISCOVERY

Analyze more than 17,000 EST clusters to discover new genes involved in a biological response. EST clusters are represented on all three arrays in the Rat Genome U34 Set.

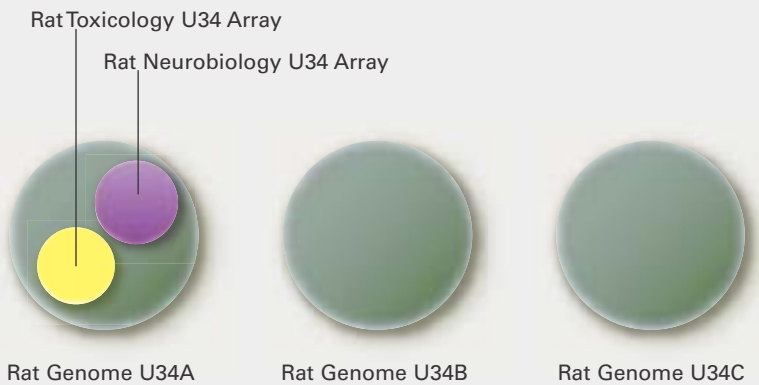
IMPROVE LEAD COMPOUND DISCOVERY

Use the Rat Genome U34 Set to identify gene expression "fingerprints" for compound efficacy and toxicity. Develop screening assays that will improve the quality of leads in discovery by eliminating compounds with a high probability of failure.

BUILD QUANTITATIVE DATABASES

GeneChip expression arrays allow for highly parallel, reproducible, quantitation of gene expression levels. The Rat Genome U34 Set is an ideal tool for developing robust rat expression profile databases.

Figure 1. Subsets of the Rat Genome U34A Array are represented on the Rat Toxicology U34 Array and the Neurobiology U34 Array.



DATA SETS PROFILED

The Rat Genome U34 Set represents more than 24,000 genes and EST clusters. The sequences include all rat sequence clusters from Build 34 of the UniGene Database (created from GenBank 107/dbEST, Nov. 18, 1998) and supplemented with additional annotated gene sequences from GenBank 110. UniGene clusters are represented by an exemplar sequence that is the most 3' and complete sequence in the cluster.

RELATIONSHIP OF ARRAYS IN SET AND PORTFOLIO

The Rat Genome U34 Set contains three arrays (RG-U34A, RG-U34B and RG-U34C). The A array contains probe sets representing all full-length or annotated genes, as well as thousands of EST clusters. The B and C arrays contain only EST clusters. In addition, all sequences represented on the Rat Toxicology U34 Array and Rat Neurobiology U34 Array are also represented on the A array of this set.

The Rat Toxicology U34 Array represents more than 850 transcripts chosen in collaboration with pharmaceutical toxicologists. The Rat Neurobiology U34 Array represents approximately 1,200 transcripts relevant to neurobiology including genes for kinases, cell surface receptors, cytokines, growth factors, and oncogenes. The transcripts represented on this array were chosen in collaboration with academic and industrial neuroscientists.

GeneChip® Rat Neurobiology U34 Array

The GeneChip® Rat Neurobiology U34 Array is a powerful tool for generating a focused set of data specific to the study of neurobiology. Detect gene expression changes in neurological tissues and cells using a single GeneChip array.

Application

STUDY >1,200 RELEVANT NEUROBIOLOGY GENES

Affymetrix teamed up with neurobiology researchers from both academic and pharmaceutical laboratories to select the sequences represented on the Rat Neurobiology U34 Array. Over 1,200 sequences relevant to neurobiology research were identified and included in the array design.

STUDY AND DEFINE NEUROBIOLOGICAL PATHWAYS

Parallel analysis of greater than 1,200 neurobiology genes allows you to define and refine relationships between genes, as well as answer critical questions about molecular and cellular pathways and regulation.

GENERATE EXPRESSION DATABASES

Gene expression data generated by Affymetrix GeneChip arrays has been shown to be reproducible over a wide range of mRNA concentrations. Combining that quality with the superior specificity and sensitivity of oligonucleotide arrays make this technology the best choice for generating database quality data.

DATA SETS PROFILED

The Rat Neurobiology Array contains probes representing greater than 1,200 mRNA sequences selected from Build 34 of the UniGene database. Sequences were selected based on their known relevance to the field of neurobiology.

RELATIONSHIP TO RAT GENOME U34 SET

All probe sets represented on the Rat Neurobiology Array are also represented on the A array of the Rat Genome U34 Array Set.

Included on Rat Neurobiology U34 Array

Kinases	Serine/threonine, Ca2+/Calmodulin-dependant, MAP, Receptor tyrosine, c-AMP dependant, MRCK, Protein Kinase C, JAK, P13, Rhodopsin, others
Membrane Channels	Potassium, Chloride, Sodium, others
Receptors	Dopamine, GABA, Muscarinic, Purineurgic, Olfactory, Nicotinic, Opiod, Glutamate, Serotonin, NMDA, Adrenergic, Acetylcholine, AMPA/Kainate, Retinoic Acid, Prostaglandin, others
ATPases	Sodium/Potassium, Calcium
Apoptosis Related	bcl-2 bcl-x, BAD, Fas, Bax, others
Cytokines	IL-1b, IL-2, IL-3, IL-4, IL-6, IL-7, IL-9, IL-10, IL-12, IL-13, IL-15, IL-18, TNF
Growth Factors	Insulin-like GF, platelet derived GF, Fibroblast GF, Nerve GF, Transforming GF-alpha and beta, VGF, others
Synthases	Prostaglandin H, Nitric Oxide
Transporters	Glucose, Glutamate/aspartate, Dopamine, Serotonin, others
Transcription Factors	Smad, NF-kB, CREB, HES, HNF-3, NGFI-B, REST, others
CNS Disease-Specific	Synuclein 1, Prion protein, Cathepsin E, Huntington's disease, Presenilin-2, MASH-1 and 2, Enolase, Synaptotagmin, Nestin, others
Oncogenes	c-fos, c-jun, rab3, rab4, p21, others
Others	Syntaxin, Neurexin, Calpain, GABA, Phosphotases, Phosphodiesterases, Neurotransmitters

GeneChip® Rat Toxicology U34 Array

The GeneChip® Rat Toxicology U34 Array is a powerful tool for detecting changes in gene expression due to a toxic or stress-related response. By design, this array provides a focused set of data specific for genes relevant to the study of toxic or stress-related responses.

Application

STUDY THE ROLE OF >850 GENES AND ESTs

To provide the most relevant set of toxicology genes, the sequences represented on the Rat Toxicology U34 Array were selected from published scientific literature and in collaboration with pharmaceutical toxicologists.

DEFINE MOLECULAR MECHANISMS FOR TOXICITY

Classic toxicology studies are based on end-point determinations that offer little information on molecular mechanisms. Use the Rat Toxicology U34 Array to better understand the molecular mechanisms of how known genes interact to produce toxic endpoints.

BUILD TOXICOLOGY DATABASES

GeneChip expression arrays allow reproducible quantitation of gene expression levels. These qualities make the Rat Toxicology U34 Array ideal for developing valuable toxicology databases.

SCREEN AND PRIORITIZE CANDIDATE PHARMACEUTICAL COMPOUNDS

Define surrogate markers of toxicity for use early in the drug development cycle. Early elimination of compounds with a high likelihood of failure in later-stage safety testing will save both time and money. The Rat Toxicology Array can also be used to help rank the most promising candidate molecules to take further into development.

DATA SETS PROFILED

The Rat Toxicology U34 Array contains probes representing >850 genes and EST clusters selected from Build 34 of the UniGene database. Specific full-length sequences were selected based on their known relevance to a toxic or stress-related response. EST clusters were selected based on their homology to these known genes. UniGene clusters are represented by an exemplar sequence that is the most complete and most 3' sequence in the cluster.

RELATIONSHIP OF ARRAYS IN SET AND PORTFOLIO

All sequences represented on the Rat Toxicology U34 Array are also represented on the Rat Genome U34A Array.

Included on Rat Toxicology U34 Array

Metabolism Enzymes	CYP450s, acyltransferases, sulfotransferases, etc.
Growth Factors and Receptors	IGFs, Interleukins, NGFs, TGFs, VEGF, etc.
Kinases and Phosphotases	Lipid kinases, MAPKs, Stress-activated kinases, etc.
Nuclear Receptors	Retinoic acid, Retinoid X, PPARs, etc.
Transcription Factors	Oncogenes, Stats, NF-kappa B, Zinc-finger, etc.
DNA Damage Repair Genes	Polymerases, Topoisomerases, GADDs, RAG, etc
Apoptosis Genes	Bcl-2 family, Bad, Bax, Caspases, Fas, etc.
Stress Response Genes	Drug transporters, Heat-shock proteins, etc.
Membrane Proteins	Gap-junction proteins, Na+/K+-ATPase, Selectins
Cell-cycle Regulators	Cyclins and associated proteins

Critical Specifications for GeneChip Rat Genome Arrays

	Rat Genome U34 Set	Rat Neurobiology U34 Array	Rat Toxicology U34 Array
Number of arrays in set	3	1	1
Array size	Standard format	Mini format. Please use Mini format protocols from the *GeneChip® Expression Analysis Technical Manual* when performing experiments with these arrays.	Mini format. Please use Mini format protocols from the *GeneChip® Expression Analysis Technical Manual* when performing experiments with these arrays.
Feature size	24 m	24 m	24 m
Oligonucleotide probe length	25-mer	25-mer	25-mer
Probe pairs/sequence	16	16	~20
Hybridization controls	*bioB, bioC, bioD,* and *cre*	*bioB, bioC, bioD,* and *cre*	*bioB, bioC, bioD,* and *cre*
Poly-A controls	*dap, lys, phe, thr* and *trp*	*dap, lys, phe, thr* and *trp*	*dap, lys, phe, thr* and *trp*
Housekeeping control genes	actin, GAPDH, hexokinase	actin, GAPDH, hexokinase	actin, GAPDH, hexokinase
Detection sensitivity	1:100,000*	1:100,000*	1:100,000*

*As measured by detection in a comparative analysis between a complex target containing spiked control transcripts and a complex target with no spikes.

Ordering Information

GeneChip® Rat Genome Arrays

Rat Genome U34A Array
900249 Contains 5 Arrays
900286 Contains 30 Arrays

Rat Genome U34B Array
900250 Contains 5 Arrays
900287 Contains 30 Arrays

Rat Genome U34C Array
900251 Contains 5 Arrays
900288 Contains 30 Arrays

Rat Toxicology U34 Array
900252 Contains 5 Arrays

Rat Neurobiology U34 Array
900283 Contains 5 Arrays

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Not for use in diagnostic procedures.

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