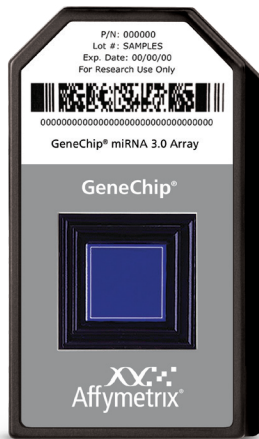


GeneChip[®] miRNA 3.0 Array

Discover more than ever before



GeneChip[®] miRNA 3.0 Array:

Comprehensive coverage – The only array to provide complete coverage of miRBase v17, snoRNA and scaRNA probes on the same array

Unique design – The only array designed to independently interrogate pre-miRNA and mature miRNA in the same experiment

Superior sensitivity – Detects 94% of miRNA transcripts at 1.0 amol

High reproducibility – 0.95 reproducibility (inter- and intra-lot)

Simple protocol – 45-minute assay without pre-amplification or purification steps

Low sample input – Requires as little as 130 ng total RNA

Introduction

The universe of known miRNAs has rapidly expanded over the past few years, and Affymetrix is keeping pace with research communities' discovery and understanding of small non-coding RNAs by introducing GeneChip[®] miRNA 3.0 Array. This array is a powerful tool for studying the role of small non-coding RNAs and their importance in many diseases including cancer which has been frequently described as a disease of disordered gene expression. As a result, it is becoming increasingly important to complement messenger RNA (mRNA) gene expression studies with miRNA analysis to understand the biological context of differentially expressed genes.

In addition, microRNAs exhibit much higher stability in comparison to mRNAs, which allows expression profiling in routinely stored, formalin-fixed and paraffin-embedded (FFPE) specimens, including samples that are several years old.

These key functional gene products are estimated to regulate approximately 30% of all protein-coding genes and cover the broadest spectrum of developmental and physiological mechanisms such as:

- Protein translation inhibition
- Alternative splicing regulation
- Ribosomal RNA processing
- mRNA degradation

Comprehensive and unique array content

Affymetrix' high-density array provides the most sensitive, accurate, and complete measurement of small non-coding RNA transcripts involved in gene regulation.

GeneChip miRNA 3.0 Array is the only array with:

- 100% miRBase v17 coverage
- 153 organisms (19,724 probe sets)
- 2,216 human snoRNA and scaRNA probe sets
- 2,999 probe sets unique to human, mouse and rat pre-miRNA hairpin sequences

Superior performance

GeneChip[®] miRNA 3.0 Array demonstrates superior performance:

- 0.95 reproducibility
- 94% of transcripts detected at 1.0 amol from 130 ng of input total RNA
- >3 logs of dynamic range
- Strong signal correlation between GeneChip miRNA 3.0 and miRNA 2.0 Arrays
 - 0.99 signal correlation for mature miRNA
 - 0.98 signal correlation for all probe sets
- Fold change correlation between GeneChip miRNA 3.0 and miRNA 2.0 Arrays
 - 0.98 signal correlation for mature miRNA
 - 0.97 signal correlation for all probe sets

Figure 1: Signal and fold change correlation of the GeneChip® miRNA 3.0 Array with 100 ng brain target. Rep 1 vs. rep 2, detected probe sets only. A: Human miRNA. B: Human RNA, all types.

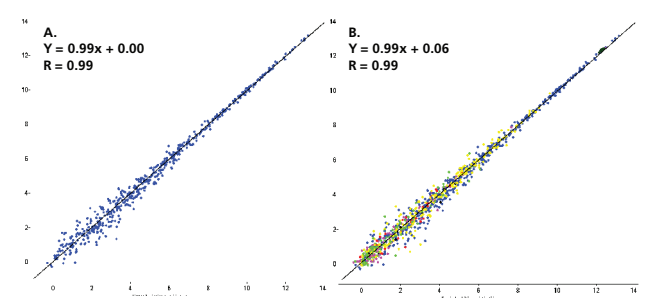


Figure 1: The Pearson product moment correlation coefficient was calculated from median signal or fold change for detected probe sets. Probe sets were defined as detected if the median p-value from three replicates was less than 0.06. 100 ng of total RNA was used as input to each labeling reaction. **A.** Median RMA signal correlation for detected miRNA in human brain with the miRNA 3.0 Array. **B.** Median RMA signal correlation for detected miRNA, precursor miRNA and sno/scaRNA with the miRNA 3.0 Array. **Blue:** miRNA; **Yellow:** CD box; **Red:** HAca box; **Green:** snoRNA; **Black:** scaRNA; **Magenta:** stem-loop precursor miRNA; **Dark Green:** 5.8S rRNA control.

Figure 2: Signal and fold change correlation: miRNA 3.0 Array vs. miRNA 2.0 Array.

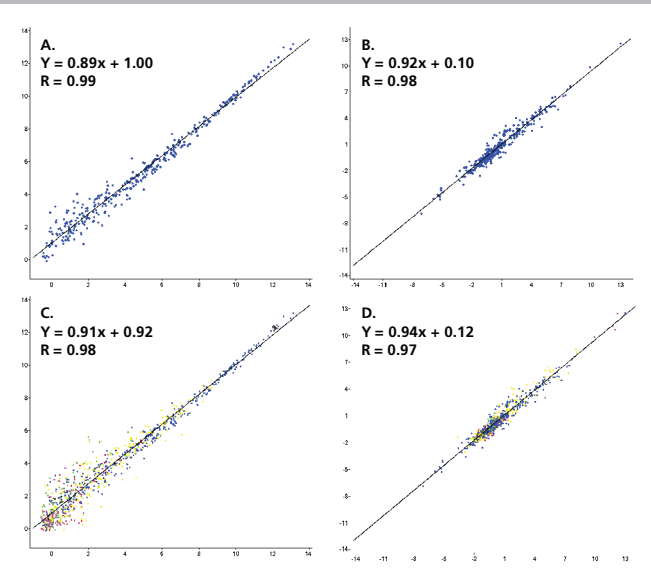


Figure 2: The Pearson product moment correlation coefficient was calculated from median signal or fold change for detected probe sets. Probe sets were defined as detected if the median p-value from three replicates was less than 0.06. 100 ng of total RNA was used as input to each labeling reaction. **A.** Median RMA signal correlation for detected miRNA in human brain. **B.** Median fold change correlation for detected human miRNA (brain vs. lung). **C.** Median RMA signal correlation human (brain) for miRNA detected miRNA, precursor miRNA and sno/scaRNA. **D.** Median fold change correlation for detected human miRNA precursor miRNA and sno/scaRNA (brain vs. lung). **X-axis:** miRNA 2.0 Array. **Y-axis:** miRNA 3.0 Array. **Blue:** miRNA; **Yellow:** CD box; **Red:** HAca box; **Green:** snoRNA; **Black:** scaRNA; **Magenta:** stem-loop precursor miRNA; **Dark Green:** 5.8S rRNA control.

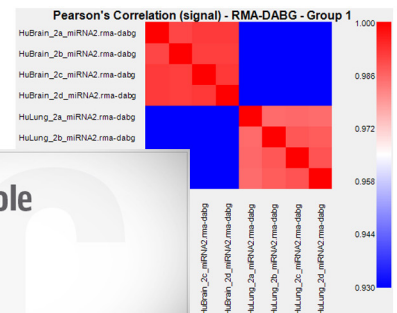
The easiest and most affordable solution

Coupled with the simple and affordable Affymetrix® FlashTag™ Biotin HSR RNA Labeling Kit, GeneChip® miRNA 3.0 Array offers easy target preparation (even from challenging samples such as FFPE) and is the most affordable solution available.

The 45-minute assay—from RNA sample to labeled target—does not involve complex enzymology (amplification) or purification steps that can reduce the yield or bias your results by introducing false positives or false negatives.

Simple data analysis

Data analysis with the GeneChip miRNA 3.0 Array is simple. Use one of the GeneChip-compatible™ Software programs you currently use for analyzing expression data or download the **free** Expression Console™ Software from www.affymetrix.com.



Expression Console Software version 1.2 has been upgraded to include analysis for the miRNA 2.0 and miRNA 3.0 Arrays.

The software contains the same recommended analysis workflow as miRNA QC Tool and supports both 32- and 64-bit versions of Windows® XP and Windows 7 operating systems. This enables it to scale a significantly higher number of arrays that can be analyzed at the same time compared to the miRNA QC Tool.

Expression Console Software also provides all of the data management, tables, and visualization features used with Affymetrix® 3' IVT, Gene ST, and Exon ST Arrays.

Organism	Probe sets
<i>Acyrtosiphon pisum</i>	103
<i>Aedes aegypti</i>	125
<i>Aegilops tauschii</i>	2
<i>Amphimedon queenslandica</i>	16
<i>Anopheles gambiae</i>	65
<i>Apis mellifera</i>	168
<i>Aquilegia caerulea</i>	45
<i>Arabidopsis lyrata</i>	375
<i>Arabidopsis thaliana</i>	266
<i>Arachis hypogaea</i>	32
<i>Ateles geoffroyi</i>	54
BK polyomavirus	2
BPCV1	1
BPCV2	1
<i>Bombyx mori</i>	562
<i>Bos taurus</i>	676
Bovine herpesvirus 1	12
<i>Brachypodium distachyon</i>	143
<i>Branchiostoma floridae</i>	189
<i>Brassica napus</i>	48
<i>Brassica oleracea</i>	7
<i>Brassica rapa</i>	23
<i>Brugia malayi</i>	31
<i>Caenorhabditis briggsae</i>	131
<i>Caenorhabditis elegans</i>	340
<i>Caenorhabditis remanei</i>	137
<i>Canis familiaris</i>	289
<i>Capitella teleta</i>	134
<i>Carica papaya</i>	1
<i>Cerebratulus lacteus</i>	2
<i>Chlamydomonas reinhardtii</i>	85
<i>Ciona intestinalis</i>	513
<i>Ciona savignyi</i>	25
<i>Citrus Clementine</i>	5
<i>Citrus reticulata</i>	4
<i>Citrus sinensis</i>	64
<i>Citrus trifoliata</i>	6
<i>Cricetulus griseus</i>	2
<i>Culex quinquefasciatus</i>	93
<i>Danio rerio</i>	248
<i>Daphnia pulex</i>	46
<i>Dictyostelium discoideum</i>	2
<i>Drosophila ananassae</i>	75
<i>Drosophila erecta</i>	78
<i>Drosophila grimshawi</i>	72
<i>Drosophila melanogaster</i>	426
<i>Drosophila mojavensis</i>	71
<i>Drosophila persimilis</i>	69
<i>Drosophila pseudoobscura</i>	274
<i>Drosophila sechellia</i>	76
<i>Drosophila simulans</i>	178
<i>Drosophila virilis</i>	74
<i>Drosophila willistoni</i>	72
<i>Drosophila yakuba</i>	75

Organism	Probe sets
<i>Echinococcus granulosus</i>	26
<i>Echinococcus multilocularis</i>	23
<i>Ectocarpus siliculosus</i>	52
Epstein-Barr virus	44
<i>Equus caballus</i>	360
<i>Festuca arundinacea</i>	15
<i>Fugu rubripes</i>	109
<i>Gallus gallus</i>	544
<i>Glycine max</i>	207
<i>Glycine soja</i>	13
<i>Gorilla gorilla</i>	80
<i>Gossypium arboreum</i>	1
<i>Gossypium herbacium</i>	1
<i>Gossypium hirsutum</i>	36
<i>Gossypium raimondii</i>	4
<i>Haliotis rufescens</i>	5
<i>Heliconius melpomene</i>	4
Herpes B virus	3
Herpes simplex virus 1	25
Herpes simplex virus 2	24
Herpesvirus of turkeys	28
<i>Homo sapiens</i> (miRNA)	1733
<i>Homo sapiens</i> (pre-miRNA)	1658
<i>Homo sapiens</i> (scaRNA)	32
<i>Homo sapiens</i> (snoRNA)	1674
<i>Homo sapiens</i> (CD box)	347
<i>Homo sapiens</i> (HAcA box)	163
<i>Hordeum vulgare</i> (Barley)	23
Human cytomegalovirus	17
HIV-1	4
<i>Hydra magnipapillata</i>	20
Infectious laryngotracheitis virus	10
<i>Ixodes scapularis</i>	37
JC polyomavirus	2
KSHV	25
<i>Lagothrix lagotricha</i>	45
<i>Lemur catta</i>	15
<i>Locusta migratoria</i>	14
<i>Lottia gigantea</i>	64
<i>Lotus japonicus</i>	4
<i>Macaca mulatta</i>	488
<i>Macaca nemestrina</i>	70
<i>Malus domestica</i>	2
Mareks disease virus	26
Mareks disease virus type 2	36
<i>Medicago truncatula</i>	383
Merkel cell polyomavirus	2
<i>Monodelphis domestica</i>	146
Mouse cytomegalovirus	29
Mouse gammaherpesvirus 68	28
<i>Mus musculus</i> (miRNA)	1111
<i>Mus musculus</i> (pre-miRNA)	855
<i>Nasonia giraulti</i>	32
<i>Nasonia longicornis</i>	28

Organism	Probe sets
<i>Nasonia vitripennis</i>	53
<i>Nematostella vectensis</i>	78
<i>Oikopleura dioica</i>	63
<i>Ornithorhynchus anatinus</i>	533
<i>Oryza sativa</i>	548
<i>Oryzias latipes</i>	4
<i>Ovis aries</i>	103
<i>Pan paniscus</i>	83
<i>Pan troglodytes</i>	525
<i>Petromyzon marinus</i>	302
<i>Phaseolus vulgaris</i>	10
<i>Physcomitrella patens</i>	280
<i>Picea abies</i>	41
<i>Pinus taeda</i>	38
<i>Pongo pygmaeus</i>	600
<i>Populus euphratica</i>	5
<i>Populus trichocarpa</i>	237
<i>Pristionchus pacificus</i>	99
<i>Pygathrix bieti</i>	9
<i>Rattus norvegicus</i> (miRNA)	680
<i>Rattus norvegicus</i> (pre-miRNA)	486
<i>Rehmannia glutinosa</i>	6
<i>Rhesus lymphocryptovirus</i>	68
<i>Rhesus monkey rhadinovirus</i>	11
<i>Ricinus communis</i>	63
<i>Saccharum officinarum</i>	16
<i>Saccoglossus kowalevskii</i>	114
<i>Saccharum spp.</i>	20
<i>Saguinus labiatus</i>	40
<i>Schistosoma japonicum</i>	78
<i>Schistosoma mansoni</i>	5
<i>Schmidtea mediterranea</i>	257
<i>Selaginella moellendorffii</i>	64
<i>Simian virus 40</i>	2
<i>Solanum lycopersicum</i>	36
<i>Sorghum bicolor</i>	148
<i>Strigamia maritima</i>	5
<i>Strongylocentrotus purpuratus</i>	64
<i>Sus scrofa</i>	257
<i>Symphalangus syndactylus</i>	10
<i>Taeniopygia guttata</i>	215
<i>Tetraodon nigroviridis</i>	109
<i>Theobroma cacao</i>	82
<i>Tribolium castaneum</i>	402
<i>Triticum aestivum</i>	44
<i>Triticum turgidum</i>	1
<i>Vigna unguiculata</i>	2
<i>Vitis vinifera</i>	186
<i>Xenopus laevis</i>	21
<i>Xenopus tropicalis</i>	169
<i>Xenoturbella bocki</i>	8
<i>Zea mays</i>	319

Array content design

Probe sets	Number	Source
Mature miRNA	19,931	Content is derived from the Sanger miRBase v17 (www.mirbase.org)
Human, mouse, and rat pre-miRNA	2,999	Content is derived from miRBase miRNA (www.mirbase.org)
snoRNA and scaRNA	2,216	Probe sets targeting human snoRNAs and scaRNAs are derived from snoRNABase (www.snorna.biotoul.fr/coordinates.php) and the Ensembl Archive (www.ensembl.org/biomart/martview).

Array specifications

Critical specifications	Description
Reproducibility	>0.95
Transcripts detected at 1.0 amol	94%
Dynamic range	>3 logs
Total RNA input	130–1,000 ng
Feature size	11 µm
Probe length	25-mer

Instrument and software requirements

	Description
Hybridization volume	130 µL
Instrumentation	GeneChip® Hybridization Oven 645, GeneChip® Fluidics Station 450, and GeneChip® Scanner 3000 7G
Software	GeneChip® Command Console® Software (AGCC), Expression Console™ Software
Library files	miRNA3_0
Fluidics script	FS450_0002

Ordering information*

Part number	Product	Description
Arrays		
902017	GeneChip® miRNA 3.0 Array	2 arrays
902018	GeneChip® miRNA 3.0 Array	6 arrays
902019	GeneChip® miRNA 3.0 Array	30 arrays
Reagents		
900454	GeneChip® Eukaryotic Hybridization Control Kit	Sufficient for 30 reactions
900301	Control Oligo B2, 3nM	Sufficient for 30 reactions
900720	GeneChip® Hybridization, Wash, and Stain Kit	Sufficient for 30 reactions
901910	Affymetrix® FlashTag™ Biotin HSR RNA Labeling Kit	Sufficient for 10 reactions
901911	Affymetrix® FlashTag™ Biotin HSR RNA Labeling Kit	Sufficient for 30 reactions

*GeneChip® miRNA 3.0 Arrays and Affymetrix® FlashTag™ Biotin HSR RNA Labeling Kits will be available after April 16, 2012.

Limited warranty. Affymetrix warrants to you (but not to any third party) that GeneChip® Arrays shall be free from physical defects. Affymetrix' sole and exclusive liability and your sole and exclusive remedy under the foregoing warranty, is to provide you with a replacement array provided if the following conditions are met: (i) you used the affected array prior to its expiration date and notify Affymetrix promptly after you become aware of the defect; (ii) you cooperate with Affymetrix in Affymetrix' investigation as to the cause of the alleged physical defect and provide any information required by Affymetrix; and (iii) Affymetrix shall make the final determination in good faith, as to whether: (a) any physical defect in fact exists; and (b) if so, whether such physical defect was caused by Affymetrix' manufacturing process, and not user error, improper storage or handling, or any other cause for which Affymetrix is not responsible.

Affymetrix, Inc. Tel: +1-888-362-2447 ■ Affymetrix UK Ltd. Tel: +44-(0)-1628-552550 ■ Affymetrix Japan K.K. Tel: +81-(0)3-6430-4020
Panomics Solutions Tel: +1-877-726-6642 panomics.affymetrix.com ■ USB Products Tel: +1-800-321-9322 usb.affymetrix.com

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