WAFERGEN BIOSYSTEMS

Product Note

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SmartChip Human microRNA Panel V3

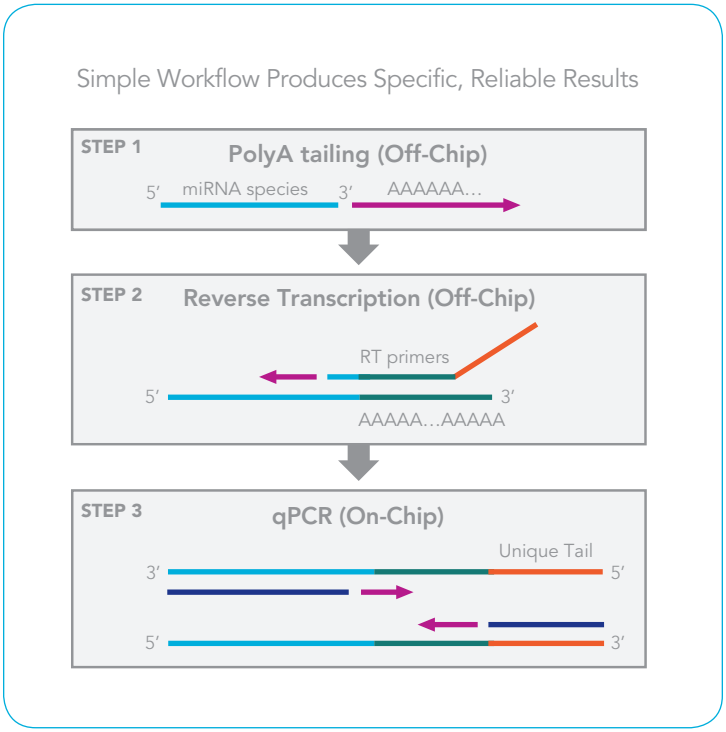
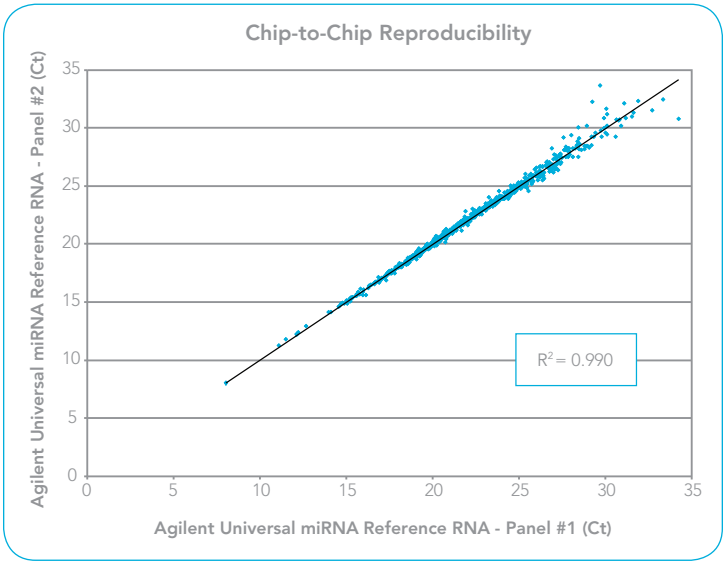


Figure 1. The SmartChip microRNA protocol includes polyadenylation of the microRNA followed by a reverse transcription reaction using a set of RT primers. These 2 reactions are performed off the SmartChip nanowell chip. A qPCR reaction is subsequently performed on the chip with miRNA-specific primers typically eliminating the need for the complex microRNA primer pools for preamplification.



The Most Comprehensive MicroRNA Panel

MicroRNA species have a key regulatory role in the functioning of gene expression. The SmartChip Human microRNA Panel Version 3 (V3) can be used to quantitatively measure the expression of the most disease-relevant 1100 human microRNA species in quadruplicate. The pre-optimized primer pairs have been selected using strict bioinformatics criteria to provide single-base discrimination, high sensitivity and reproducible amplification. As shown in Figure 1, the simple workflow begins with an off-chip polyadenylation of total RNA. This is followed by an off-chip reverse transcription reaction, and on-chip quantitative PCR (qPCR) reaction. The process yields robust and reproducible expression results across all 1100 microRNAs (Figure 2).

Flexible, High-Throughput, High-Density Real-Time PCR

The SmartChip Human miRNA Panel V3 is thermal cycled on the SmartChip qPCR Cycler. The SmartChip System combines the high throughput of microarrays with the power of real-time PCR to provide the unique flexibility to perform gene expression discovery, validation and screening on a single platform. The SmartChip Cycler can process a SmartChip Panel to perform up to ~1300 assays in quadruplicate on one sample in just over 2 hours, or the system can profile tens to hundreds of genes and from hundreds to several samples, respectively.

Figure 2. SmartChip Human microRNA Panel V3 results are highly reproducible. Universal miRNA reference RNA was used to demonstrate the high correlation between replicate SmartChip Panels. Each data point represents the mean of up to 4 replicates.

Single Base Discrimination

microRNA Assay	microRNA Sequence Target	Cross-Reactive Species	% Cross Reactivity
HSA-LET-7E	TGAGGTAG**G**AGGTTGTATAGTT TGAGGTAG**T**AGGTTGTATAGTT	LET-7E (Self) LET-7A	100% 3.5%
HSA-MIR-100	AACCCGTAGATCCGA**A**CTTGTG AACCCGTAGATCCGA**T**CTTGTG	miR-100 (Self) miR-99a	100% 0.05%
HSA-MIR-29A	TAGCACCAT**C**TGAAATCGGTTA TAGCACCAT**T**TGAAATCGGTTA	miR-29a (Self) miR-29c	100% 0.6%
HSA-MIR-320A	AAAAGCTGGGTTGAGAGGGC**G**A AAAAGCTGGGTTGAGAGGGC**A**A	miR-320a (Self) miR-320b	100% 2.2%

Figure 3. *Single base discrimination can be achieved using SmartChip Human microRNA Panel V3 as illustrated by the low cross-reactivity between closely-related family members of Let-7 and other miRNA species.*

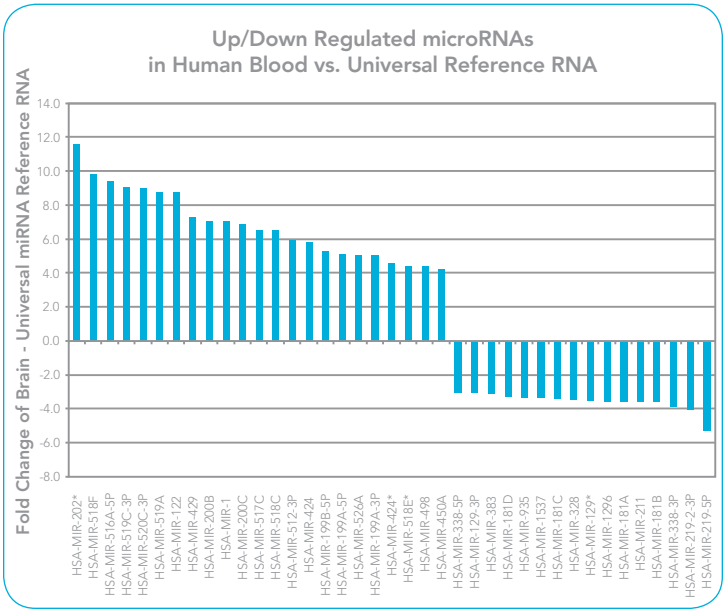


Figure 4. *Differential expression of 1100 microRNAs from human brain tissue and universal miRNA reference RNA. The SmartChip Human microRNA Panel V3 was used to determine which microRNAs expression levels were maximally increased or decreased.*

Single Base Discrimination Provides Reliable, Specific Results

The 1100 microRNAs on the SmartChip Human microRNA Panel V3 include the highly-related Let-7 and other microRNA families, many members of which differ by only a single base. The panel provides excellent discrimination between the family members, with cross-reactivity typically below 4% (Figure 3). The design of the SmartChip Human microRNA Panel V3 enables reliable assessment of microRNA expression levels for a variety of applications, including comparing differential expression from different sample types (Figure 4).

SmartChip User-Defined Human microRNA Panel Configurations

The 1100 microRNAs on the SmartChip Human microRNA Panel V3 provides an excellent tool for discovering biological signatures. With the open format of the 5184-feature SmartChip nanowell chip, subsets of microRNAs can be easily configured into a variety of different options from 12 to 384 microRNAs, for 96 to 3 samples, respectively. A popular option uses 384 microRNAs in quadruplicate with 3 samples. This solution is extremely cost-effective for validation studies.

Contact WaferGen for the most extensive, quantitative, cost-effective solution for Human microRNAs.

Contact your local sales representative:
sales@wafergen.com
For support: support@wafergen.com
For general information: info@wafergen.com

Ordering Information

Part Number	Description	Contents
430-000085	SmartChip Human microRNA Panel V3, 1 Panel	1 Panel with Controls
430-000086	SmartChip Human microRNA Panel V3, 10 Panels	10 Panels with Controls

7400 Paseo Padre Parkway
Fremont, CA 94555 U.S.A.
info@wafergen.com
+1 510.651.4450
www.wafergen.com

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