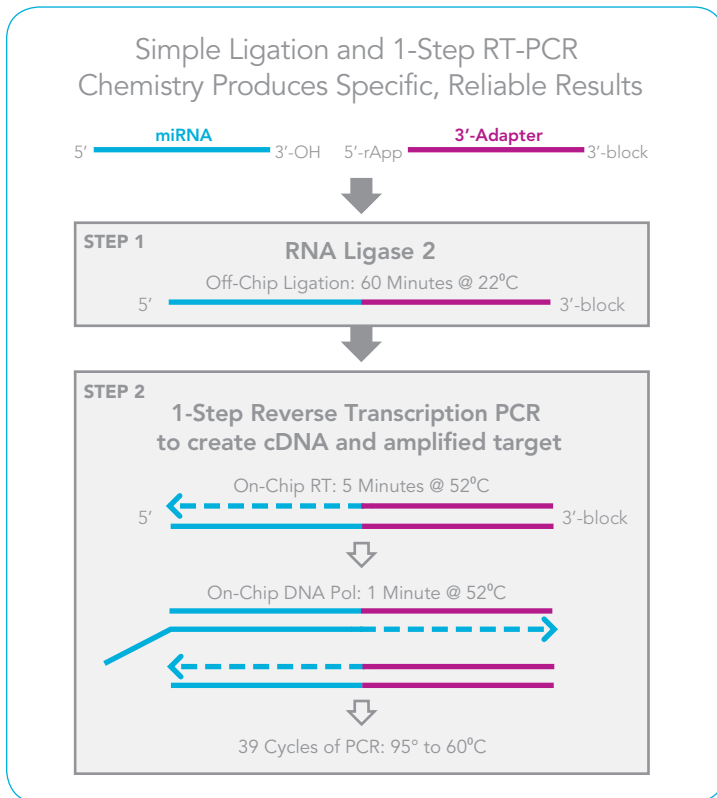


## SmartChip Human microRNA Panel V2 Product Note



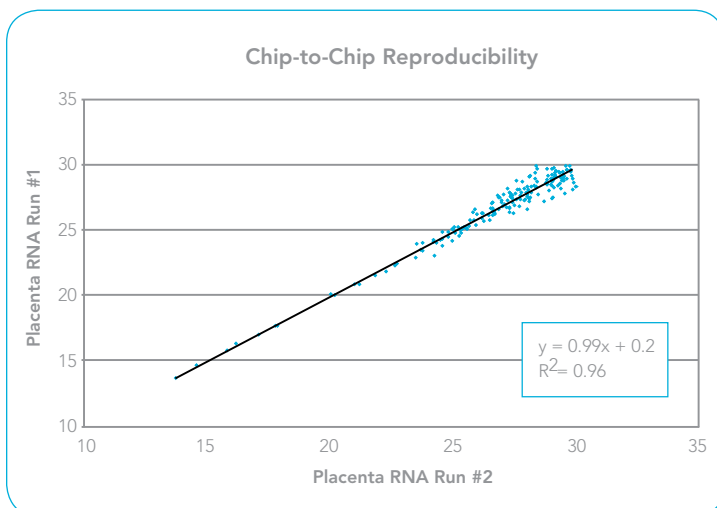
**Figure 1.** The SmartChip microRNA chemistry uses a method common to microRNA cloning to ligate a pre-adenylated linker (red) to the microRNA (blue) off-chip to provide a longer template and facilitate discrimination between closely homologous microRNAs. One-Step RT-PCR is subsequently performed on the chip, eliminating the need for the complex microRNA primer pools used in other methods.

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

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 1200 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.

### The Most Comprehensive MicroRNA Panel

The SmartChip Human microRNA Panel Version 2 (V2) assesses the expression of 1200 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. The simple workflow begins with off-chip ligation of a 3' adapter to the RNA (Figure 1). This is followed by a one-step, on-chip reverse transcription real-time PCR (RT-PCR) reaction. The process yields robust and reproducible expression results across all 1200 microRNAs (Figure 2).



**Figure 2.** SmartChip Human microRNA Panel V2 results are highly reproducible. Placenta total 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 Reactivity
HSA-LET-7E	TGAGGTAG <b>G</b> AGGTTGTATAGTT (LET-7E) TGAGGTAG <b>T</b> AGGTTGTATAGTT (LET-7A)	100% 3.8%
HSA-LET-7A	TGAGGTAGTAGGTTGTAT <b>A</b> GTT (LET-7A) TGAGGTAGTAGGTTGTAT <b>G</b> GTT (LET-7C)	100% 2.8%
HSA-LET-7C	TGAGGTAGTAGGTTGT <b>A</b> TGGTT (LET-7C) TGAGGTAGTAGGTTGT <b>G</b> TGGTT (LET-7B)	100% 1.5%
HSA-MIR-100	AACCCGTAGATCCGAT <b>T</b> CTTGTG (MIR-100) AACCCGTAGATCCGA <b>A</b> CTTGTG (MIR-99A)	100% 0.01%

Figure 3. Single base discrimination can be achieved using SmartChip Human microRNA Panel V2 as illustrated by the low cross-reactivity between Let-7 and other family members.

Up/Down Regulated microRNAs in Human Blood vs. Brain Tissue

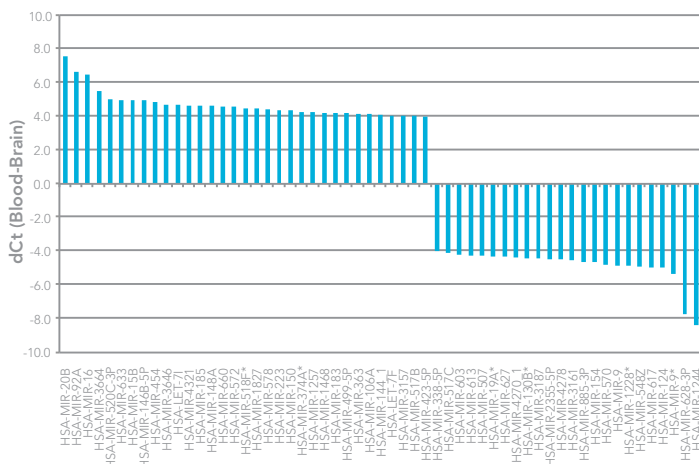


Figure 4. Differential expression of 1200 microRNAs can be determined in about 2 hours. The SmartChip Human microRNA Panel V2 was used to determine which microRNAs were differentially expressed by >4 dCt, using 1 µg of RNA from human blood vs. brain tissue.

Single Base Discrimination Provides Reliable Results

The 1200 microRNAs on the SmartChip Human microRNA Panel V2 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 V2 enables reliable assessment of microRNA expression levels for a variety of applications, including different tissue types (Figure 4).

SmartChip Custom Human microRNA Panel Configurations

The 1200 microRNAs on the SmartChip Human microRNA Panel V2 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 3 to 384 microRNAs, for 384 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:

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For support: support@wafergen.com

For general information: info@wafergen.com

Ordering Information

Part Number	Description	Contents
430-000018	SmartChip Human microRNA Panel V2, 1 Panel	1 Panel with Controls
430-000019	SmartChip Human microRNA Panel V2, 10 Panels	10 Panels with Controls

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