

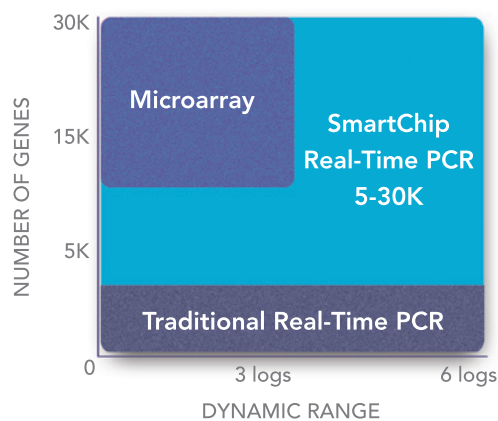
SmartChip Real-Time PCR System

Product Note

The SmartChip Real-Time PCR System combines the high throughput analytical capabilities of traditional microarrays with the gold standard sensitivity and exemplary dynamic range of real-time PCR. The end result is a streamlined biomarker discovery, exploration and validation process for pharmaceutical, diagnostic and academic researchers.



- 5,184 Gene Reactions
- > 6-log Dynamic Range
- < 2 Hour Run Time
- 0.5 µg Total RNA Sample



PRE-OPTIMIZED AND CUSTOM-BUILT SMARTCHIP GENE PANELS

Human MicroRNA Panel

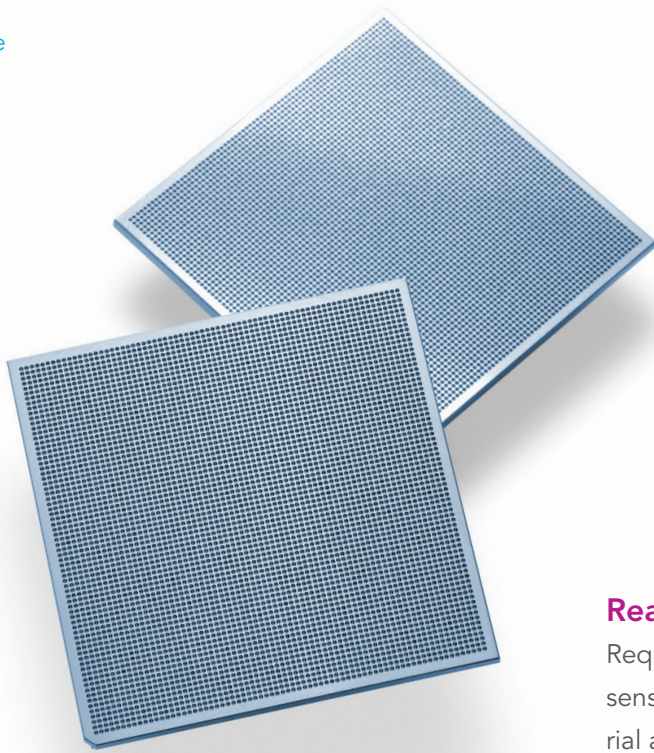
- Over 800 validated microRNAs in quadruplicate
- miRBase 14.0 sequence database referenced

Human Oncology Panel

- Sequences spanning 16 functional groups
- 969 genes in quadruplicate

Custom Panels

- Developed from your specific assay
- Custom design from WaferGen library



Thousands of genes on a single quantitative PCR nano-well SmartChip

With more than 5,000 gene reactions on a single SmartChip, the WaferGen technology platform is setting the gold standard for gene expression studies. The system takes the proven accuracy of real-time PCR a giant leap forward with single-copy gene sensitivity and a dynamic range of 6 logs. This innovation enables researchers to dramatically increase the discovery rate of new gene markers with the enhanced sensitivity and expanded dynamic range of the SmartChip Real-time PCR System.

High throughput gene expression profiling and analysis

With a run time of less than two hours, scientists can obtain results and generate actionable information on the same day. WaferGen's state-of-the-art technology speeds time-to-results while increasing the cost effectiveness of validating relevant gene expression biomarkers.

Real-time quantitative PCR in nano-volumes

Requiring only 0.5 μg of total RNA sample, the highly sensitive system uses a minute amount of biological material and mastermix to query thousands of genes in a single run. The efficient utilization of precious samples, while eliminating reagent waste, saves money and extends research dollars.

Simplified workflow

The protocol begins with cDNA from 500 ng of total RNA sample being combined with mastermix and then dispensed onto a content-ready SmartChip using the SmartChip Nanodispenser. Then the sealed SmartChip is loaded onto the SmartChip Cycler and the run is started with a click of the mouse. A raw data file consisting of Ct and Tm values is automatically generated within hours.

Using this simple and fast workflow, researchers can gain higher quality data that yield unique signatures not found by other methods.

The plug-and-play system safeguards against operator errors and frees the technologist for other important tasks, increasing overall lab productivity. You gain confidence in your results while resting assured that highest quality research is being performed in your lab.

Rich data generation with built-in system controls

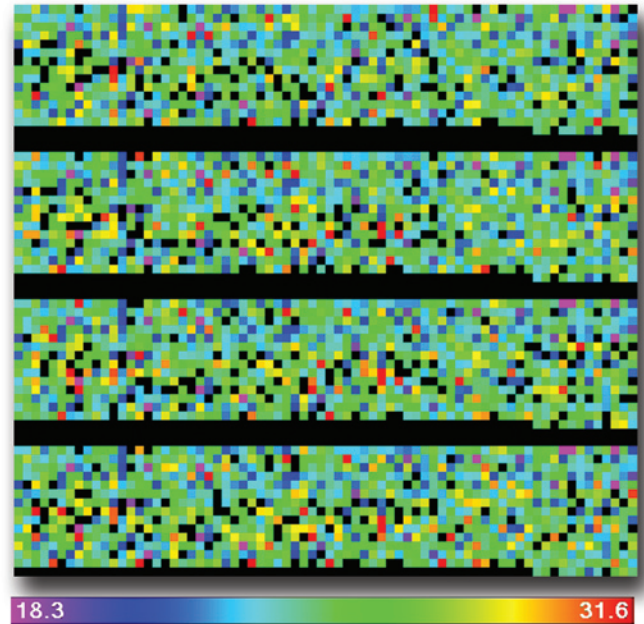
The cDNA assay results in thousands of data points which can comprise a comprehensive portrait of relative gene expression in a sample. Positive control targets are also generated to verify the proper functioning and dynamic range performance of the system. In addition, data from model target systems demonstrate the accuracy and consistency of the system. Gain thousands of data points in a single chip and see your results in quadruplicate with the SmartChip Real-Time PCR System from WaferGen.

Multiple potential technology applications

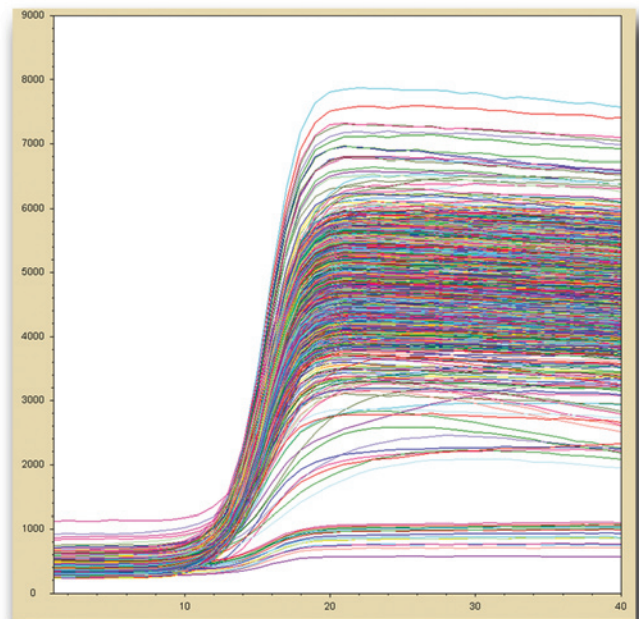
The SmartChip Real-Time PCR System is a versatile technology platform with the potential to enable a broader view of gene function, pathway networks and biomarker discovery. In the future, researchers will be able to utilize this powerful technology platform for gene expression profiling, genotyping, single-cell genetic analysis, digital PCR and whole genome real-time PCR studies.

SmartChip Services

WaferGen research scientists are available to perform pathway-based gene expression profiling for oncology, immunology, metabolic and stem cell research using the SmartChip technology platform. Contact WaferGen to find out how we can speed your current research efforts with fee-based outsourced services.



Heat map depicting Ct values of an analysis using the SmartChip Oncology Gene Panel 1.5.1 using universal cDNA in which primers are printed in 4 replicate panels. The color scale for the Ct values is shown at the bottom.



Growth curves of identical assays run on a SmartChip.

SYSTEM COMPONENTS AND WORKFLOW

The SmartChip

The chip contains a 5184-nanowell array (72 X 72) which is preloaded with primer content optimized for performance with the SmartChip Real-Time PCR System.

The SmartChip Nanodispenser

The sample, combined with master mix and controls, is dispensed under vacuum into the 5184-nanowell SmartChip. Five hundred (500) ng of starting sample yields the cDNA equivalent of 96 pg of sample per well.

The SmartChip Cycler

Once loaded with sample, the SmartChip is placed into the WaferGen SmartChip Cycler. Each prepared sample undergoes 5,184 nano-scale real time polymerase chain reactions (RT-PCR) in parallel. The SmartChip Real-Time PCR system employs a qPCR reaction compatible with SYBR green I DNA binding dye. Results are reported in the form of Ct (threshold cycles) and Tm (melting temperatures) for amplicon melting analyses.

Assay Chemistry

Forward and reverse primers for each gene are designed using bioinformatics tools. Primers are selected based on criteria such as specificity, insensitivity to sequence polymorphisms, amplicon size, and minimization of primer artifacts. All primers pre-loaded on SmartChips are verified using human universal reference total RNA in conjunction with a two-step qPCR assay. Primer specificity is determined using (a) melting curve analysis of amplicon product, (b) gel electrophoresis analysis of amplicons and (c) sequence verification of the amplicons.

ORDERING INFORMATION

SmartChip Cycler and Software

Part number SSCY1000

- SmartChip Cycler
- SmartChip software (necessary for operation of the Cycler)
- PC including monitor, keyboard and power cords

SmartChip Nanodispenser

Part number SCNDS100

- WaferGen SmartChip Nanodispenser vacuum system
- WaferGen Nanodispenser fill fixture

SmartChip Human Oncology Gene Panel 1.5.1

Part number WONCO986

969 SYBR oncology assays covering 16 functional groups printed in quadruplicate including 21 endogenous and 6 exogenous controls.

SmartChip Human microRNA Panel

Part number WMIRN809 – 809

SYBR microRNA assays printed in quadruplicate, selected from the miRBase 14.0 sequence database including 11 endogenous and 6 exogenous controls.

Licensed for research use only. Not for use in diagnostic procedures.

7400 Paseo Padre Parkway
Fremont, CA 94555
U.S.A.
+1 510. 651.4450
info@wafergen.com
www.WaferGen.com

Advancing the science of tomorrow today.

MRKT-0005 2010

