

# SmartChip™ Real-Time PCR System

## MAXIMIZED REAGENTS, HIGH-THROUGHPUT RESULTS

### Quick and Efficient Gene Expression or Genotyping

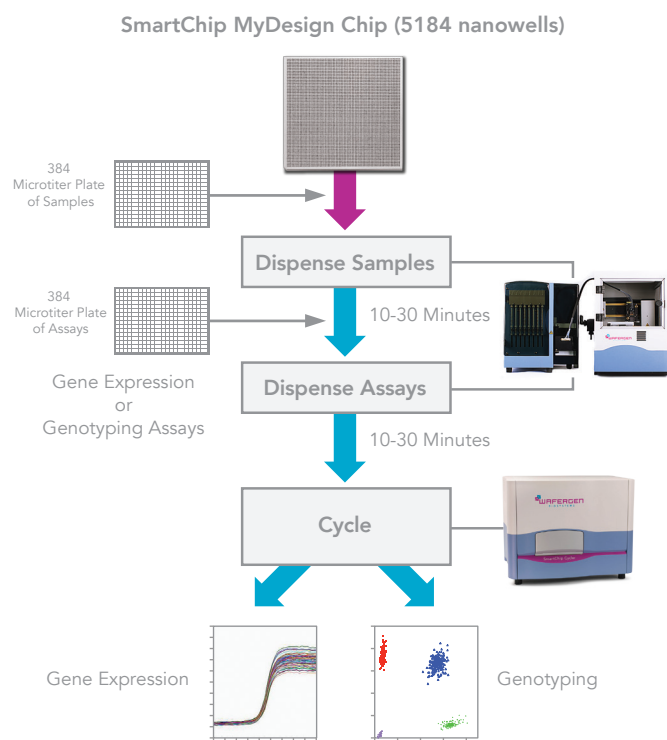
**AGILE** - Run up to 5,184 reactions in under two hours

**HIGH-THROUGHPUT** - Nano-scale volumes more efficient than 96 or 384 well plates, and do not require pre-amplification

**ACCESSIBLE** - Dispense your own assays in the lab or have chips pre-printed - take control of your workflow

### Fast and Accessible Workflow

The core strength of Quantitative PCR is the wide range of high sensitivity analysis which can be performed in real time. Making full use of that sensitivity is challenging because standard technologies, such as 96 and 384 well plates, prevent full utilization of high-throughput capabilities while simultaneously wasting reagents. Other existing high-throughput technologies force you into rigid sample and assay configurations while adding expensive and time consuming pre-amplification.



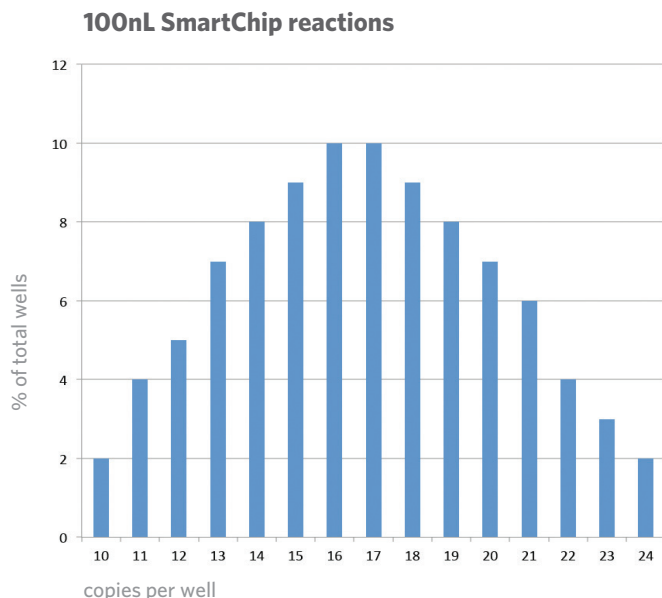
**FIGURE 1.** Add your samples and assays to the SmartChip Real-Time PCR SmartChip with an easy and simple workflow

**TABLE 1: FLEXIBLE PRINTING FORMAT**

Assays	Samples	Assays	Samples
12	384	96	54
24	216	120	42
36	144	144	36
48	108	216	24
54	96	248	20
72	72	296	16
80	64	384	12

Flexible printing formats on the MSND for both genotyping and gene expression

The SmartChip Real-Time PCR System resolves those issues by providing a wide range of sample and assay combinations on our 5,184 nanowell SmartChip, which allows for nanoscale reactions without the need for pre-amplification (Table 1). Our fast and easy workflow enables dispensing of samples and assays in flexible formats for complete control over the entire workflow (Figure 1). When combined with the SmartCycler's short run time, you can interrogate over 10,000 samples in a single day.

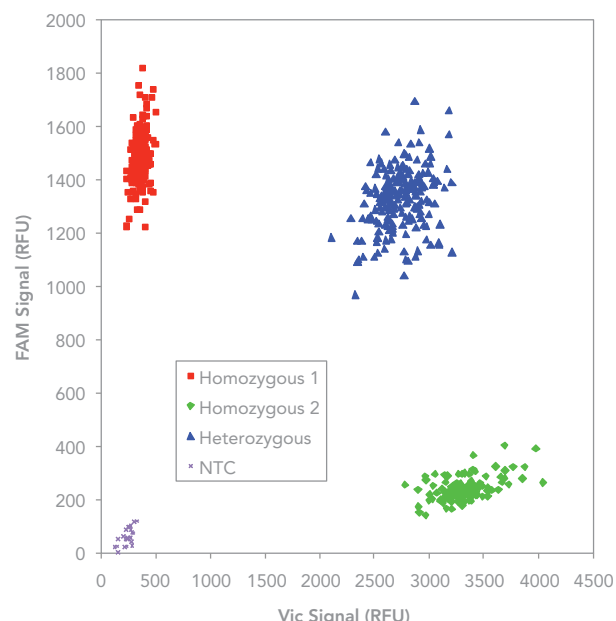


**FIGURE 2.** 98% of the SmartChips 5,184 wells contain at least 10 copies per 100 nl reaction without requiring pre-amplification at 0.5 ug/mL of gDNA

### High-Throughput Without Pre-Amplification

The power of gene expression and genotyping with the SmartChip Real-Time PCR System is the sheer number of individual samples that can run in a single chip. Conventional systems based on 96- or 384-well plates require milliliters of reagents and samples to achieve sufficient sensitivity. This approach makes experiments expensive and limits researchers to fewer runs in order to conserve precious samples. Alternatively, solutions require costly pre-amplification to ensure sufficient sample copies to conduct the study. These approaches either waste time through failed runs or increase costs through expensive pre-amplification.

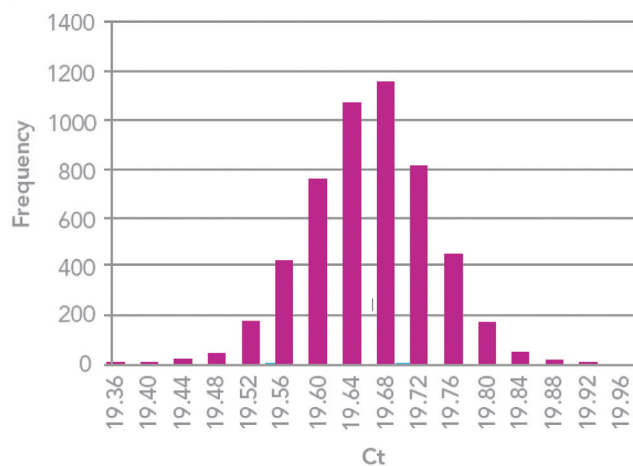
The SmartChip's nanoliter wells provide the ideal mix of efficiency and reliability. At 100X less volume than 384-well plates, experiments can be conducted with increased reagent efficiency. This reduced quantity of sample makes the requirement of multiple replicates minimal. Despite being at the nanoliter scale, the SmartChip protocol produces at least 10 copies of sample in over 98% of wells, eliminating the need for pre-amplification (Figure 2). Similar nano-scale solutions risk having one copy or less in 50% of their wells under similar conditions, often leading to incorrect results.



**FIGURE 3.** Genotyping call rates >98% and concordance >99.8 are typical using the SmartChip Real-Time PCR System

### You Choose: Gene Expression or Genotyping

The SmartChip Real-Time PCR System uses precision instrumentation and a metal alloy chip to provide high thermal and assay uniformity. This enables high call rates and concordance for gene expression or genotyping experiments. The system, as designed, has filters for FAM, VIC™, ROX, and SYBR dyes. Whether you are running a pathway or function-based expression study or a SNP genotyping study the system offers the ideal high-throughput solution.



**FIGURE 4:** Thermal uniformity yields high precision results. A single sample of positive control DNA at 325 copies / well was loaded into each of the 5,184 wells

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