In the last issue of Biosystems Solutions (Issue 5, pages 5 & 6) we described the Applera Genomic Initiative and the benefits it brings to Genomic research with a collection of nearly 30,000 Gene expression, functionally tested Assays-on-Demand products, one for every human transcribed gene. A major benefit of Assays-on-Demand products is that they enable gene expression researchers to apply real-time PCR quantitative precision, sensitivity and linearity to a greater number of gene targets, without the trouble and costs associated with designing and validating assays for each gene.

This will encourage moving to real-time PCR for validation of hits generated by high-density micro arrays, and will generate the need for more sophisticated and higher throughput solutions to allow parallel analysis of multiple genes with this approach.

The new Applied Biosystems 7900 Micro Fluidic Card (see figure 1) is a tool specifically designed to allow high-throughput parallel analysis of gene expression patterns, that could be defined as a low-density, gene expression custom array.

The Micro Fluidic Card is designed for custom assay configuration using Assays-on-Demand Gene Expression Products and the ABI PRISM® 7900HT Sequence Detection System. More than 15,000 of these assays are already available on-line from the Applied Biosystems web site https://store.appliedbiosystems.com

The Micro Fluidic Card is fast and easy-to-use. It comprises 384-wells connected by a series of channels. Assays are first loaded and lyophilised in the wells of the Card. Eight sample-loading ports allow delivery of a single sample-specific reaction mix. Next, the sample is mixed with TaqMan® Universal PCR Master Mix and loaded into the card ports. A short centrifugation step transfers the mixes into the individual wells of the card, which is sealed with Micro Fluidic Card Sealer (see figure 2). The Micro Fluidic Card is then loaded onto the 7900HT system and real-time PCR is initiated. Accurate, real-time quantitative gene expression results are available immediately after completion of the thermal cycling process (see figure 3).

Benefits at a Glance

Ease-of-use

- Provides 5' nuclease gene expression assays lyophilised on the Micro Fluidic Card and ready to go
- Streamlines the reaction set-up process and requires only 24 pipetting steps necessary to fill a 384-well card
- Provides access to the high-throughput, 384-well format without the expense of liquid handling robotics
- Eliminates concerns associated with the accuracy of small-volume deliveries when working with 384-well plates

Efficient use of biological samples

- Low-density custom array technology provides a greater amount of information per sample

Reduced reagent consumption

- The 384-well format card features 2µL reaction volumes, resulting in approximately 10 fold reduction of reagent usage and precious RNA sample than the traditional 384-well plate format

Quality results

- Real-time PCR, using the 5' nuclease assay with TaqMan® MGB probes is the ‘Gold Standard’ for nucleic acid quantitation. With unparalled sensitivity, specificity and linear dynamic range it provides high-quality gene expression quantification results.
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The PCR process and the 5' nuclease process are covered by patents owned by Roche Molecular Systems, Inc. and F. Hoffmann-La Roche Ltd.

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