

# Walk-Away Non-Contact Sample Handling and Reagent Dispensing for Genotyping in a Compact System

David Lorenz<sup>1</sup>, Philip Hassell<sup>1</sup>, Carl Jarman<sup>1</sup>, Derek Morris<sup>2</sup>, Andrea DeCosta<sup>2</sup>

<sup>1</sup>Labcyte Inc., Sunnyvale, CA, USA; <sup>2</sup>Department of Psychiatry, Trinity College, Dublin, Ireland

## ABSTRACT

We have developed a new liquid handling platform, the Labcyte® Deerac™ Q. The Deerac Q is the first liquid handling system to incorporate both disposable tip transfer for DNA samples and Deerac™ magnetic feedback control (MFC) non-contact PCR reagent dispensing for low volume assays. The Deerac™ Q system enables walk-away automation of low-volume PCR assay assembly for SNP genotyping, RT-PCR and gene expression. Typical time to reformat four (4) 96-well plates into one (1) 384-well plate and add PCR reagents is 8 minutes or less. Here we present SNP genotyping data whereby the Deerac Q system was used to assemble a PCR-ready plate, containing DNA sample and TaqMan® reagents.

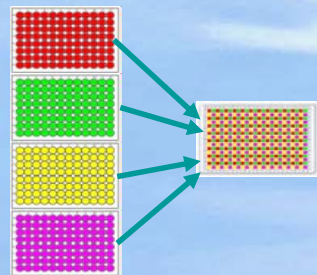


Figure 1. Plate reformatting. The Deerac Q rapidly reformats four (4) 96-well plates into one (1) 384-well plates

## LIQUID HANDLING FOR SAMPLES AND REAGENTS

The Deerac Q system provides the benefits of the proprietary MFC dispensing technology along with the benefits of disposable tips for DNA and RNA transfers. This 96-tip pipetting system enables the unattended transfer of 96 different samples at the same time from SBS standard 96-well source plates to SBS standard 384-well destination (PCR) plates as shown in Figure 1.



Figure 2. Deerac Q system. The Deerac Q deck and overhead gantry with the dual pipetting heads are shown. The deck has 16 plate positions which can be used for any combination of SBS standard plates, tip racks and waste. There are also four (4) reservoir positions for the Deerac MFC dispensing.

## RESULTS

In this poster we have genotyped two SNPs that are putatively linked to schizophrenia in a population of 83 subjects. These assays were set up on the deck of the Deerac Q assembler.

The data was analyzed in OpenArray® Genotyping Analysis Software. The data was represented in both tabular format and a scatter plot of fluorescence.

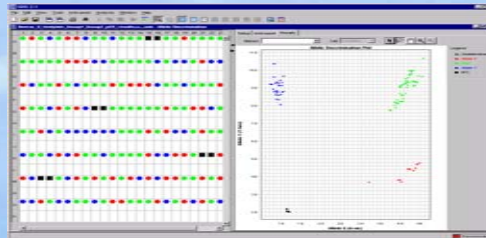


Figure 3. Results from the first genotyping assay.

The results shown in Figure 3 are plotted in terms of allele frequency. For example, in genotyping assay 1 the genotype can be represented as having two alleles A and T with three possible genotypes AA, AT, and TT. The major allele (AA) is represented in blue circles and the minor allele (TT) in red circles, those cases which contain both alleles (AT) are represented in green circles. Genotypes that couldn't be called are represented by black squares.

In addition to the subject samples, five positive and eight no-template controls (NTC) were also genotyped for both assays. These NTC samples are represented by the black squares in Figure 3.

These results were then cross referenced to the expected allele. The results of the eight no template controls were negative, showing no cross-contamination of samples.

Five (5) positive controls were also genotyped. The results from these positive controls can be observed in the tables below. They were all genotyped correctly indicating that the assays were set up properly.

Plate 1-Assay 1			Plate 1-Assay 2		
HapMap Crosscheck			HapMap Crosscheck		
Samples	Test	Online	Samples	Test	Online
NA11829	A-vic	AA	NA11829	A-vic/T-fam	AT
NA11839	A-vic	AA	NA11839	A-vic/T-fam	AT
NA12146	A-vic	AA	NA12146	A-vic	AA
NA12156	A-vic	AA	NA12156	A-vic/T-fam	AT
NA12750	A-vic/G-fam	AG	NA12750	A-vic/T-fam	AT

Figure 4. Results from the crosscheck of known positive controls.

## CONCLUSIONS

The Deerac Q system has been successfully used to generate data for 2 alleles in 83 subjects with no loss of data. No detection of fluorescence was observed in any of the eight no-template controls for either genotyping assay. The five positive controls produced the correct allele for both genotyping assays.