

BD Atlas™ Plastic Human 12K Microarray

The only calibrated microarray on the market

- Rely on thoroughly tested long oligos[†] for optimal specificity and minimal cross-hybridization
- Use a microarray that provides greater sensitivity
- Our lot-specific Calibration Standards provide more accurate data analysis

Introducing the most powerful expression profiling tool to date from BD Biosciences Clontech—the **BD Atlas™ Plastic Human**

12K Microarray. This array contains sequences from nearly 12,000 genes printed in duplicate on a plastic support surface. The unique combination of high-throughput gene expression with a plastic format promotes experimental efficiency, lower background, and accurate analysis. In addition, we print thoroughly tested long oligos on each array, which provides superior specificity and sensitivity. All these features make the BD Atlas Plastic Human 12K Microarray the best choice for your expression profiling needs.

Make accurate and direct comparisons

As a unique added feature of our plastic microarrays, we calculate a Calibration Standard for every gene represented on the array. This means that you can directly compare the results of plastic microarrays from different lots and different experiments with confidence.

With each new lot of microarrays printed, several microarrays (some from the beginning, middle, and end of the printing) are hybridized using an antisense oligo calibration mixture. Following quantitation, the resulting lot-specific calibration values are averaged and listed on our web site, www.clontech.com/atlas/atlasimage. These values are easily imported into BD AtlasImage™ Software, which will automatically calculate standardized array signals, yielding the most accurate and meaningful array comparisons. This standardization protocol is ideal for database generation, as it allows statistically significant data to be generated from microarrays printed at different times.

Figure 1 describes the importance of array calibration to generate accurate, meaningful results. Panel A first illustrates the

Calibration Procedure for Gene X				
	Lot 1	Lot 2		
Average Antisense Intensity (9 arrays)				
	$= 400$	$= 325$		
Calculated Calibration Standard (Calibrated to Lot 1)	$\frac{400}{400} = 1$	$\frac{400}{325} = 1.23$		
Experimental Analysis of Gene X				
Sample A hybridized to array from Lot 1; Sample B hybridized to array from Lot 2				
	Sample A (Lot 1 Signal Intensity)	Sample B (Lot 2 Signal Intensity)	Expression Ratio	Interpretation
Raw Signal (No Calibration)	500	350	$\frac{500}{350} = 1.43$	Misleading
Calibrated Signal (Intensity x Calibration Standard)	500 x 1 = 500	350 x 1.23 = 430.5	$\frac{500}{430.5} = 1.16$	Valid

Figure 1. More accurate expression data using calibrated BD Atlas™ Plastic Microarrays. Panel A. After printing each lot of BD Atlas Plastic Microarrays, sample arrays from the beginning, middle, and end of the printing run are hybridized with a mix of synthetic ³³P-labeled antisense oligonucleotides corresponding to all genes on the array. Then, the intensity of each hybridization signal is quantitated by phosphorimaging and averaged. Average antisense intensities are calculated for each gene, as shown above for hypothetical Gene X. Calibration Standards are then calculated for each array lot relative to the initial printing run. All genes in the first printed lot (Lot 1, as shown) are assigned a Calibration Standard of "1.0". Panel B. After normalizing arrays based on the overall signal intensities from all genes on the array, experimental intensities for Gene X can then be compared using calculations that correct for array printing variations between lots. Without this correction, gene expression comparisons are less accurate and less reliable.

calculation of lot-specific Calibration Standards for a target gene. Then, two different RNA samples are analyzed for target gene expression differences using two arrays—one from each lot (Panel B). Without calibration, the target gene appears upregulated (Raw Signal, Panel B). Our practice of gene standardization demonstrates how the lot-specific value corrects for typical printing variations across lots (Calibrated Signal, Panel B). In this case, array calibration shows an insignificant difference in gene expression.

By eliminating false positives generated by noncalibrated arrays, you save time for further study of real expression differences.

Depend on superior sensitivity

Of course, even a calibrated array is not an accurate tool if the printed oligos aren't reliable. That's why we rigorously develop and test our oligo sequences to ensure optimal hybridization and sensitivity. To accomplish this, we develop a long oligo for each gene on the array. Each long oligo is an 80-base DNA fragment

BD Atlas™ Plastic Human 12K Microarray...continued

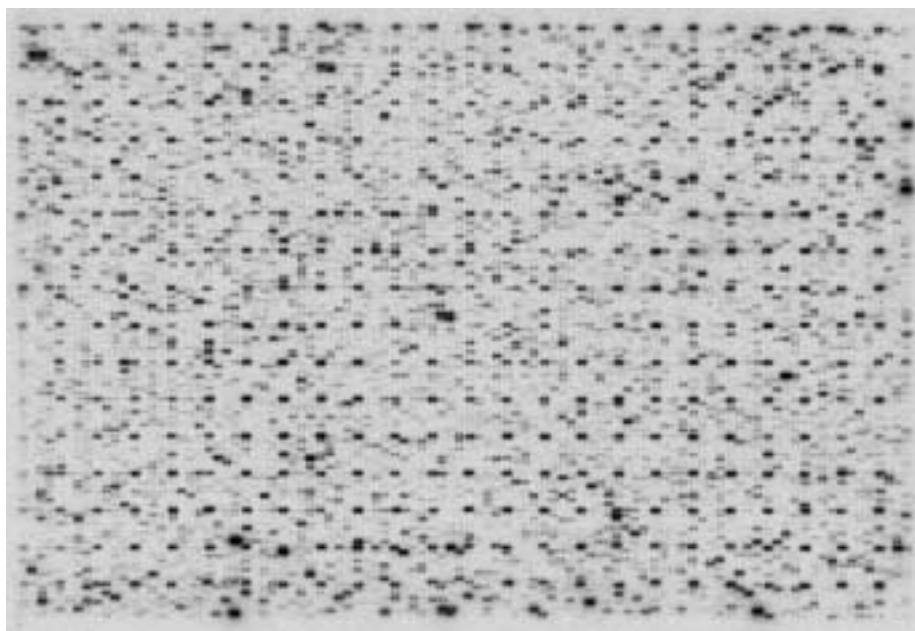


Figure 2. Using the BD Atlas™ Plastic Human 12K Microarray identifies gene expression in human colon total RNA. The array was hybridized using a ^{33}P -labeled probe generated from human colon BD™ Premium Total RNA, according to instructions outlined in the User Manual (PT3591-1).

that combines the high hybridization efficiency of a cDNA fragment with a short oligonucleotide's ability to distinguish between homologous genes. We use antisense hybridization to thoroughly test each oligonucleotide, confirming its identity and ability to produce a strong hybridization signal. Oligos that display weak hybridization signals or exhibit cross-hybridization to other fragments are redesigned. Without these tests, greater than 25% of all oligos would be incapable of producing a unique and usable hybridization signal. BD Biosciences Clontech is the only company performing this type of rigorous antisense testing, giving you a microarray that delivers credible results (Figure 2).

Take advantage of a unique format

BD Atlas Plastic Microarrays offer an unparalleled combination of ease and efficiency. Like nylon arrays, BD Atlas Plastic Microarrays require no special equipment for imaging (just a standard phosphorimager). And like glass arrays, these plastic arrays are nonporous, which greatly decreases nonspecific background and minimizes washing time. The unique quality of the plastic material allows the

printing of far more spots than on a nylon membrane, and the spots are more uniform and discrete, facilitating accurate, automated analysis. The plastic support is rigid and resistant to warping at high wash temperatures, so the array does not distort and complicate image analysis. Combine these features with the easier, improved automatic grid alignment featured in our new BD AtlasImage 2.7 Software, and you get a microarray that delivers quality data in little time.

The Plastic Human 12K Microarray also furnishes you with a powerful option in data analysis. Because the gene coordinates represented on the BD Atlas™ Plastic Human 8K Microarray have been maintained on the 12K Microarray, you can easily calibrate your 12K Microarray gene signals to the corresponding values generated on the 8K Microarray. This allows you to further compare your data from 8K Microarray experiments by adding new gene expression data. With this feature, you save time by building upon existing data, instead of starting over.

Product	Size	Cat. #	NEW!
BD Atlas Plastic Human 12K Microarray 2 arrays		7931-1	

Components

- 2 Plastic Human 12K Microarrays
- BD PlasticHyb Hybridization Solution
- BD Atlas™ Nucleospin® Extraction Kit
- dNTP Mix
- BD PowerScript™ Reverse Transcriptase
- BD PowerScript™ Reaction Buffer
- Random Primer Mix with Synth. Control
- DTT
- Termination Mix
- Human Placenta Control Poly A⁺ RNA
- Deionized H₂O
- Gene List CD-ROM (PT3593-CD)
- User Manual (PT3591-1)

Related Products

- BD Atlas™ Plastic Human 8K Microarray (#7905-1)
- BD Atlas™ Plastic Mouse 5K Microarray (#7906-1)
- BD Atlas™ Plastic Rat 4K Microarray (#7909-1)
- BD Atlas™ Plastic Microarray Trial Kit (#K1845-1)
- BD AtlasImage™ 2.7 Software (#V1214-1)
- BD AtlasNavigator™ 2.0 Software (#V1221-1)
- BD Atlas™ Plastic Array Hybridization Box (#7930-1)
- BD Atlas™ Plastic Printing Kit (#K1846-1)
- BD Atlas™ Custom Plastic Arrays (#CS2050-1)
- BD Atlas™ Custom Plastic Hybridization and Analysis (#CS2013-1)
- BD AtlasImage™ Custom Analysis Service (#CS2002)

Notice to Purchaser

† Patent Pending

The BD Atlas™ Array products sold by BD Biosciences Clontech are for research purposes only. These products and the sequences of the polynucleotides thereon are intended to be used for the purchaser's own internal research purposes only and may not be used for diagnostic purposes or for human use.