

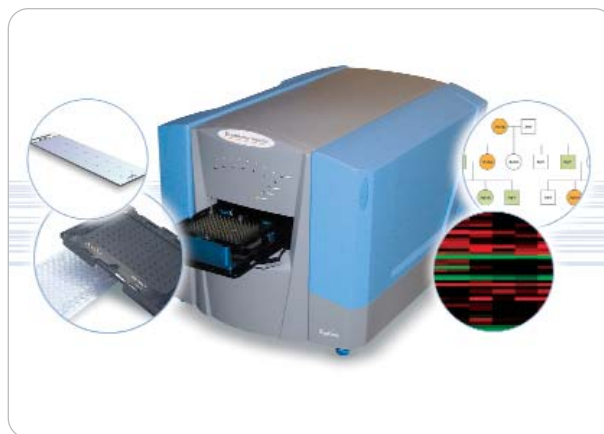
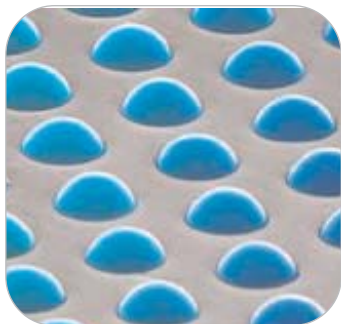
# Illumina® Beadstation 500

## A SCALABLE SYSTEM THAT GROWS WITH YOUR RESEARCH REQUIREMENTS

The BeadStation 500 is a complete, bench-top solution for genetic analysis. BeadArray™ technology, together with Sentrix® multi-sample array formats, provides flexibility in content selection and number of samples analyzed, with low minimum input requirements.

BeadArray technology delivers industry-leading quality and sensitivity due to an inherent 30-fold redundancy and the industry's only 100% functional QC on every feature of every array. The technology also utilizes 3-micron features assembled into the highest-density arrays available for genetic analysis. Combined with Illumina's novel assays, these features enable increased experimental scale with reduced sample input requirement. This aligns well with clinical applications using biopsies, fine needle aspirates or preserved samples that are often irreplaceable or too low in quantity to meet the minimum input amounts of other commercially available methods.

Both RNA- and DNA-based applications are easily performed with the system and can be processed manually or automated using Tecan liquid handlers and Illumina software. Additional applications and automation are easily added to an existing system as research needs change or as new applications become available. An Illumina Laboratory Information Management System (LIMS) is also available for genotyping applications.



### THE BEADSTATION 500 PROVIDES A FLEXIBLE GENETIC ANALYSIS PLATFORM THAT DEMONSTRATES:

- **High Performance:** powerful assay technology combined with leading-edge scanner technology delivers high-quality data and reliable results
- **Scalability:** multiple applications, multi-sample array formats and automation options make it easy to meet changing needs
- **Ease of Use:** manual or automated protocols integrate easily into laboratory workflow
- **Sensitive Detection:** BeadArray™ technology enables reduced sample input and reagent requirements—ideal for clinical samples

## Powerful Assay Technology and Multi-Sample Array Formats Deliver Expanding Application Power You Can Trust

### **GOLDENGATE® ASSAY:**

#### **Custom or Fixed Content Genotyping**

The proven GoldenGate Assay has powered the generation of hundreds of millions of genotypes worldwide, including over 60% of the genotypes generated during Phase I of the International HapMap project. GoldenGate technology leverages the strength of a proprietary allele-specific extension and ligation protocol to deliver high-quality genotyping results for 384- to 1536-plex assays. Genotyping products using the GoldenGate assay include standard content and custom-designed panels at \$0.05 - \$0.14/genotype.\*

### **INFINIUM™ ASSAY:**

#### **Whole-Genome Genotyping**

The Infinium assay is a novel protocol that enables infinite multiplexing and genome-wide SNP access. This assay utilizes a modified allele-specific primer extension method with enzymatic SNP scoring to uniformly amplify SNPs across the genome. Infinium whole-genome genotyping BeadChips are used to assess association and genome-wide linkage disequilibrium at \$0.01/genotype.\*

### **DIRECT HYBRIDIZATION:**

#### **Focused Arrays and Whole-Genome Expression Analysis**

Illumina's gene expression product line leverages a direct hybridization protocol with high-density arrays to yield a solution that requires minimal sample input (50-100 ng) and delivers maximum sensitivity. Illumina gene expression products require far less sample input than other commercially-available technologies, which typically require 2-10 µg total RNA. Unprecedented correlations with qPCR ( $r^2 > 0.93$ ) give you the advantages of microarrays with the confidence of qPCR. Illumina's gene expression products include focused arrays and whole-genome fixed content BeadChips at less than half the cost of other commercially-available solutions (including labeling reagents). Illumina Focused Arrays enable the selection of a custom set of targets (up to 1,400 human genes) and can be processed via BeadChip (16-sample) or Array Matrix (96-sample) formats.



### **DASL™ ASSAY:**

#### **Degraded RNAs/Formalin-Fixed Paraffin-Embedded Samples**

The DASL Assay utilizes proven GoldenGate technology for a gene-expression application, with RNA as starting material. With the addition of a reverse-transcription step, the GoldenGate protocol offers a novel solution for partially-degraded RNAs that produces reliable gene expression profiles at high multiplex. DASL products include standard and custom panels that can be processed using 96-sample Array Matrices or 16-sample BeadChips.

#### **A flexible system that meets your changing laboratory needs**

The investment for the complete BeadStation 500GX, a bench-top solution for GoldenGate Genotyping and Direct Hybridization Gene Expression is \$312,000.\* Additional options can be included at the time of system purchase or in the future as your needs change. A table with more details about the BeadStation 500GX system and application specifications follows.

\*All prices listed are in US Dollars.

## BEADSTATION 500GX

### GOLDENGATE GENOTYPING, DIRECT HYBRIDIZATION GENE EXPRESSION AND SYSTEM SPECIFICATION SHEET

#### GENOTYPING SPECIFICATIONS

<b>Sample Formats</b>	<b>CUSTOM OR STANDARD SNP PANELS:</b> <ul style="list-style-type: none"> <li>• Sentrix Universal-16 BeadChip (16 samples; 384-, 768- or 1536-plex)</li> <li>• Sentrix Universal-96 Array Matrix (16 samples; 384-, 768- or 1536-plex)</li> </ul>	<b>Assay Descriptions</b>	<b>GOLDENGATE GENOTYPING ASSAY:</b> for standard or custom SNP panels
<b>Sample Requirements</b>	<b>GOLDENGATE GENOTYPING:</b> 250 ng genomic DNA per assay (<0.2 ng per locus at 1536-plex)	<b>Assay Multiplex Level</b>	384, 768 or 1536 loci per sample
<b>Sample Preparation</b>	Samples can be prepared manually, or using industry-standard liquid handling robotics	<b>Data Analysis</b>	Genotyping software with confidence analysis and reporting capabilities for heritability, reproducibility, correlation, and data sub-section analysis is included with system purchase.
<b>Catalog Products</b>	<i>Linkage IV Panel:</i> 5800 SNP loci <i>MHC Panel Set:</i> 2,390 SNP loci	<b>Performance<sup>1</sup></b>	Call rate routinely >99.9% Reproducibility routinely >99.7%
<b>Custom Products</b>	User-defined SNP loci are interrogated using locus-specific, unlabeled oligonucleotide probes, analyzed on a universal content array. Minimum project size is 96 samples. Design services are include	<b>Additional Applications</b> (requiring Option Package purchase)	<b>INFINIUM WHOLE-GENOME GENOTYPING:</b> The Infinium assay enables whole-genome genotyping applications with unlimited multiplexing and an input of just 750 ng genomic DNA per assay (for 100,000 loci this is 7.5 pg per locus). The Human-1 Genotyping BeadChip has >100,000 loci designed with an exon-centric focus.

1. Linkage Panel performance using CEPH DNA

#### GENE EXPRESSION SPECIFICATIONS

<b>Sample Formats</b>	<b>DIRECT HYBRIDIZATION (WHOLE-GENOME AND FOCUSED SET EXPRESSION):</b> <ul style="list-style-type: none"> <li>• <b>Focused sets:</b> 16 samples on a Custom-16 BeadChip or 96 samples on a Custom-96 Array Matrix</li> <li>• <b>Standard content:</b> deployed on various multi-sample BeadChip formats (see Catalog Products below)</li> </ul>	<b>Catalog Products</b>	<b>WHOLE-GENOME PRODUCTS:</b> <ul style="list-style-type: none"> <li>• <i>Human-6 Expression BeadChip (46K)</i></li> <li>• <i>HumanRef-8 Expression BeadChip (23K)</i></li> </ul> <b>FOCUSED ARRAY PRODUCTS (AVAILABLE IN BEADCHIP OR ARRAY MATRIX FORMATS):</b> <ul style="list-style-type: none"> <li>• <i>Human Toxicology Set (622 genes)</i></li> <li>• <i>Human Sampler Set (528 genes)</i></li> <li>• <i>Mouse Sampler Set (528 genes)</i></li> <li>• <i>Arabidopsis Sampler Set (528 genes)</i></li> </ul>
<b>Sample Requirements</b>	50-100 ng total RNA	<b>Performance (Direct Hybridization Products)</b>	Limit of Detection at 99% confidence . . . . . 0.25 pM Precision . . . . . ≤ 1.3 fold Dynamic Range . . . . . ≥ 3 logs Array-to-Array Variation (CV) . . . < 10% Correlation with qPCR . . . . . > 0.93
<b>Sample Preparation</b>	<b>DIRECT HYBRIDIZATION ASSAY:</b> Samples prepared using standard IVT methods and the Illumina RNA Amplification Kit from Ambion (single round of IVT with no fragmentation or antibody enhancement of signal necessary)	<b>Additional Applications (requiring Option Package purchase)</b>	<b>DASL ASSAY:</b> for expression analysis of partially degraded RNAs. Standard or custom content deployed 16 samples at a time on a Sentrix Universal-16 BeadChip or 96 samples at a time on a Sentrix Universal-96 Array Matrix. Assay is a modified GoldenGate protocol with user-defined panels of up to 1536 genes.
<b>Assay Description</b>	<b>DIRECT HYBRIDIZATION ASSAY:</b> Standard single-round Eberwine IVT protocol using Illumina RNA Amplification Kit (Ambion®, Inc.), one-color assay with no fragmentation or antibody-amplification steps required	<b>DASL STANDARD PRODUCTS:</b> <i>Human Cancer Panel</i> (for profiling 502 cancer-related genes)	
<b>Custom Products</b>	<b>DIRECT HYBRIDIZATION FOCUSED ARRAYS:</b> User defined arrays for up to 1400 genes, manufactured in five weeks from receipt of final gene list		

**SYSTEM SPECIFICATIONS**

<p><b>Description</b></p>	<p>A complete SNP genotyping and gene expression solution featuring microarrays configured for standard, custom and whole-genome genotyping applications and whole genome, standard or custom focused arrays for gene expression. BeadStation 500GX includes the BeadArray Reader, peripheral hardware and accessories to enable GoldenGate genotyping and Direct Hybridization gene expression applications, genotyping and gene expression analysis software, detailed technical documentation, installation and training.</p>	<p><b>Installation and Training</b></p>	<p>Comprehensive on-site installation; thorough training on genotyping and gene expression protocols including SNP/probe selection, assay design, sample preparation, array hybridization, scanning, and data analysis (also report generation for genotyping)</p>
<p><b>Sample Throughput</b></p>	<p><b>CUSTOM/STANDARD PANEL GOLDENGATE GENOTYPING:</b> 16 to 192 samples (up to 1536 SNP loci per array) per 8 hour day</p> <p><b>DIRECT HYBRIDIZATION CUSTOM/STANDARD PANEL GENE EXPRESSION:</b> 6 to 54 whole genome expression samples (46K genes) or 8 to 72 RefSeq gene expression samples (23K genes) per day</p>	<p><b>Warranty</b></p>	<p>1 year (includes scheduled preventative maintenance, laser replacement and realignment, system upgrade support and replacement parts)</p>
<p><b>Laboratory Environment</b></p>	<p>Standard pre-PCR and post-PCR facilities for genotyping, standard molecular biology lab environment for gene expression</p>	<p><b>Physical Specifications</b></p>	<p><b>DIMENSIONS:</b> 46cm (18") W x 41cm (16") H x 61cm (24") D  <b>POWER REQUIREMENTS:</b> 20A (110V); 10A (220V)  <b>WEIGHT:</b> 55kg (121.5 lbs)</p>
<p><b>System Component List</b></p>	<p><b>PURCHASE INCLUDES:</b></p> <ul style="list-style-type: none"> <li>• BeadArray Reader</li> <li>• PC with 17" flat-screen monitor</li> <li>• Custom hybridization oven</li> <li>• Six BeadChip Hybridization Cartridges</li> <li>• GenCall Genotyping Software for clustering and calling genotypes</li> <li>• GTS Reports Software for genetic analysis</li> <li>• BeadStudio™ expression software (5 licenses)</li> <li>• Two Array Matrix Hybridization Chambers</li> <li>• Two heated-lid heat blocks</li> <li>• Raised bar plate magnet</li> <li>• High-speed orbiting plate shaker</li> <li>• User documentation</li> </ul>	<p><b>Personnel Required</b></p>	<p>1 person (8-hour shift)</p>
		<p><b>User-Supplied Laboratory Equipment Required</b></p>	<ul style="list-style-type: none"> <li>• Two plate centrifuges (capable of 3,000 xg)</li> <li>• Microplate fluorometer</li> <li>• 96-well thermal cycler with heated lid</li> <li>• Oven (capable of 45-70°C)</li> <li>• Vacuum centrifuge</li> <li>• Vortex mixer</li> <li>• Microtiter plate heat sealer</li> <li>• Precision pipette (5-200 µL)</li> <li>• 8-channel precision pipette (5-200 µL)</li> </ul>

**ADDITIONAL INFORMATION**

To learn more about Illumina's products and services or to find an Illumina service provider, contact Customer Solutions.

**Illumina, Inc.**  
**Customer Solutions**  
 9885 Towne Centre Drive  
 San Diego, CA 92121-1975  
 1.800.809.4566 (toll free)  
 1.858.202.4566 (outside the U.S.)  
 techsupport@illumina.com  
 www.illumina.com

**FOR RESEARCH USE ONLY**

© 2005 Illumina, Inc.  
 Illumina, BeadArray, Sentrix, Array of Arrays, GoldenGate, Infinium, DASL and Making Sense Out of Life are trademarks of Illumina. Information is subject to change without notice.  
 Third party trademarks used herein are attributed to their respective owners.  
 Pub. No. 970-2005-003 01Jul05

