Access Array™ System

- Flexibility—sequence any region, sample type or species
- High throughput—sequence up to 384 samples in a single sequencing run
- Time savings—four hours from start to finish with minimal hands-on time

The Access Array System is a unique target enrichment platform designed for resequencing selected regions from large numbers of samples. The system combines the cost and throughput benefits of integrated fluidic circuits (IFCs) with the proven performance and flexibility of PCR. Obtain quality results while minimizing the time, cost, and labor required for targeted resequencing projects, such as mutation detection, methylation, metagenomics, and single-cell discoveries.

The Access Array System is an open platform allowing you to use any appropriate source for primers, whether they are user designed or simply ordered through our Assay Design Group.

TARGET ENRICHMENT

Target enrichment refers to the ability to select a specific region of interest prior to sequencing. For example, if you were interested in examining 20 specific genes from a large cohort of individuals, it would be both wasteful and prohibitively expensive to sample the entire genome of each individual. Instead, target enrichment technologies allow you to select regions for amplification from each individual and, thus, only sequence the specific area of interest.

SAMPLE BARCODING FOR MULTIPLEXED SEQUENCING

One of the greatest challenges facing next-generation sequencing operators today is how to use the massive amounts of throughput enabled by the new generation of sequencing equipment. While all of the systems in use today generate massive amounts of data on a per-sample basis, they lack a simple and reliable method for running multiple samples per sequencing run. Barcoding samples during the target enrichment process enables the users to pool multiple samples per sequencing run, and simplifies the sample source during the data analysis step based on the barcode.

LIBRARY PREPARATION USING AMPLECTON TAGGING

Library preparation for next-generation sequencing is by far the most time and labor consuming part of the entire next-generation sequencing process. While necessary for whole genome sequencing studies, the process can be almost entirely eliminated for resequencing projects by using PCR and amplicon tagging. By incorporating the adaptor sequences into the primer design, the amplicon product is ready to go directly into clonal amplification since it already contains the necessary capture sequences.
CUSTOM PRIMERS

Fluidigm Access Array™ Target-specific Primers and the Access Array System permit researchers to rapidly and cost effectively pursue high sample amplicon resequencing studies to better understand human genetic variation. Our microfluidics technology scales the specificity, sensitivity, and uniformity of gold standard PCR-based enrichment to enable the analysis of large sample sets across focused genomic regions.

Access Array Target-specific Primers are custom designed with Fluidigm Bioinformatics to optimize coverage and performance. When used with the Access Array System, they allow for fast, simple, and inexpensive preparation of up to 480 amplicons across 48 samples per a single Access Array IFC run. Our sample multiplex identifier (MID) barcode sequences allow up to 384 unique samples per sequencing lane, maximizing the utility of your sequencing run.

Simply provide Fluidigm with your genes or genomic regions of interest from the human genome and we will design and deliver primers for amplifying next-generation, sequencer-ready amplicons with the Access Array System.

PANELS & KITS

EGFR Gene Panel

The EGFR Gene Panel for the Access Array System introduces an efficient and effective way to test for regions of interest in cancer studies. The Epidermal Growth Factor Receptor (EGFR) gene plays a critical role in the control of cell proliferation, differentiation, and survival. Abnormalities in EGFR-related pathways have been linked to a range of cancers, including lung cancer. In addition to EGFR, this panel includes primers for the MET (hepatocyte growth factor receptor) gene. The MET gene is involved in abnormal activation of one of the EGFR-related pathways, triggering tumor growth, blood vessel proliferation, and metastasis. Studying these genes and downstream pathways provides data needed to develop new cancer treatments, making EGFR a relevant target for cancer therapy (Figure 2).

The Access Array System is compatible with multiple system components to meet a variety of application and sample throughput needs.

IFC CONTROLLER COMPATIBILITY

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>IFC Controller AX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Resequencing</td>
<td>48.48 Access Array™ IFC</td>
</tr>
<tr>
<td>Experiment tracking</td>
<td>Barcode</td>
</tr>
<tr>
<td>Gas pressure</td>
<td>Internal compressor</td>
</tr>
<tr>
<td>Interface</td>
<td>USB and Ethernet</td>
</tr>
<tr>
<td>IFC Controller AX software</td>
<td>Touchscreen interface for operating and tracking</td>
</tr>
<tr>
<td>Dimensions (approx.)</td>
<td>19 x 9.5 x 13 inches; 48.5 x 24 x 33 cm</td>
</tr>
</tbody>
</table>
BRCA1, BRCA2 and TP53 Kits

The Access Array™ BRCA1, BRCA2 and TP53 Kits introduce the ability to quickly and easily resequence regions of interest in the breast cancer susceptibility genes (BRCA1 and BRCA2) and tumor protein gene (TP53). BRCA1 and BRCA2 are tumor suppressors involved in cell growth, cell division, and DNA repair. Mutations in these genes are most commonly linked to the development of hereditary breast and ovarian cancers. In addition to BRCA1 and BRCA2, this panel includes primers for TP53 gene which negatively regulates tumor suppressors, and if inactivated, loses its checkpoint control, facilitating tumor progression. Studying these genes and associated complexes provides essential information about cancer processes (Figure 3).

Figure 3: BRCA 1 and BRCA 2 Gene Panels.

The kits are optimized to work with the Access Array System and 454 sequencers (GS FLX, GS FLX Titanium, and GS Junior), as well as with Illumina sequencers (Genome Analyzer II, HiSeq, and MiSeq).
**SEQUENCE CAPTURES**

<table>
<thead>
<tr>
<th></th>
<th>Capture per Sample</th>
<th>Capture per Array</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplicon Tagging</td>
<td>24 kb</td>
<td>1.1 MB</td>
</tr>
<tr>
<td>Multiplexed Amplicon Tagging</td>
<td>240 kb</td>
<td>11 MB</td>
</tr>
<tr>
<td>Long-range PCR</td>
<td>480 kb</td>
<td>23 MB</td>
</tr>
</tbody>
</table>

**BARCODE LIBRARIES**

<table>
<thead>
<tr>
<th>Product</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidirectional 384 Barcode Kit for the Illumina GAII, HiSeq, and MiSeq Sequencers</td>
<td>100-3771</td>
</tr>
<tr>
<td>96 Access Array Barcode Primer Plate for the 454 FLX Titanium Sequencer</td>
<td>100-3347</td>
</tr>
</tbody>
</table>

**FLUIDIGM SOLUTION FOR NEXT-GENERATION SEQUENCING**

**System Components**

Each system has two Access Array IFC Controllers and a single FC1 Cycler. The complete system allows you to load the 48.48 Access Array IFC, amplify and tag the regions of interest, and then recover the product.

**48.48 Access Array IFC**

Unique Integrated Fluidic Circuit (IFC) designed to multiplex 48 samples against 48 reactions in 30 nL reaction volumes. The 48.48 Access Array IFC prepares 2,304 individual reactions at a time while requiring only 96 pipette steps and less than 50 ng of template DNA.

**Access Array Barcode Library**

Use the 48.48 Access Array IFC with a set of 48 barcodes integrated with sequencing adaptors to pool the PCR products from different samples, post-amplification, and then sequence them as a single sample without additional library preparation.

**Design Service**

For those without predesigned primer sets, Fluidigm scientists will work closely with the user in designing, optimizing, and validating primers to ensure a fast, simple, and hassle-free experiment.

---

© 2011 Fluidigm Corporation. All rights reserved. Fluidigm, the Fluidigm logo, Access Array and FC1 are trademarks or registered trademarks of Fluidigm Corporation in the U.S. and/or other countries. All other trademarks are the property of their respective owners. Fluidigm recommends that you only purchase licensed PCR assay reagents from authorized sources.

FOR RESEARCH USE ONLY.

100-4161  10/2011