



# Data Sheet

## GeneChip® CustomSeq® Resequencing Array Program

The GeneChip® CustomSeq® Resequencing Array Program provides flexible custom arrays containing up to 300 kb of unique high-quality double-stranded sequence for less than a penny per base. CustomSeq® arrays deliver completed sequence with minimal PCR and sequence alignment in 48 hours, enabling researchers to perform large-scale resequencing of haploid organisms more efficiently and more cost-effectively than before.

### Features and Benefits

#### MORE SEQUENCE PER EXPERIMENT

GeneChip® CustomSeq® Arrays enable the analysis of up to 300,000 bases of double stranded sequence (600,000 bases total) on a single array, providing the most efficient and cost-effective method for interrogating large amounts of sequence in a single experiment.

#### LESS PCR

By leveraging long-range or whole-genome amplification methods for smaller organisms, one can dramatically reduce the number of amplification reactions required and significantly cut the time and cost involved in sample preparation.

#### NO ASSEMBLY REQUIRED

CustomSeq arrays deliver completed sequence in 48 hours with minimal alignment, curation, or hand editing, providing researchers with a faster, more efficient way to perform large-scale resequencing.

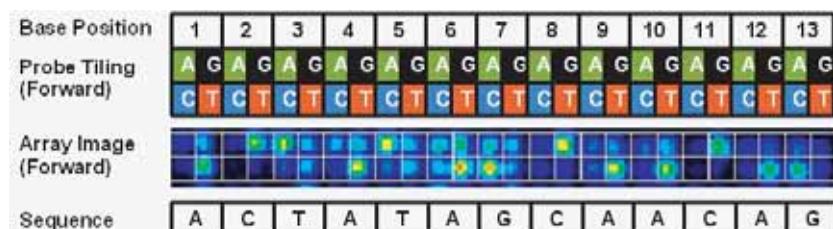
#### FLEXIBLE CONTENT AND CAPACITY

Flexible array formats containing 50 kb, 100 kb, or 300 kb of unique sequence are available. Sequences may cover a single contiguous region or multiple dispersed fragments, facilitating the analysis of whole genomes, multiple genes, and/or multiple organisms on a single array.

### Figure 1: Array Design

Oligonucleotide probes are synthesized *in situ* using the standard resequencing array tiling strategy with eight unique 25-mer probes per base position. Each 25-mer probe is varied at the central position to incorporate each possible nucleotide —A, G, C, or T— allowing for the detection of both known and novel SNPs.

TCCGGTAGCCATGAATGAGTTACTAC	Probe 1 Forward
TCCGGTAGCCATGCATGAGTTACTAC	Probe 2 Forward
TCCGGTAGCCATGGATGAGTTACTAC	Probe 3 Forward
TCCGGTAGCCATGTATGAGTTACTAC	Probe 4 Forward
ATCCGGTAGCCATGCATGAGTTACTACAGCT	Genomic Sequence of interest
TAGCCATCCGGTACGTACTCAATGATGTCGA	
AGCCATCCGGTAGTACTCAATGATG	Probe 1 Reverse
AGCCATCCGGTAGCTACTCAATGATG	Probe 2 Reverse
AGCCATCCGGTAGGTACTCAATGATG	Probe 3 Reverse
AGCCATCCGGTAGTTACTCAATGATG	Probe 4 Reverse



## Applications

### MICROBIAL GENOMES

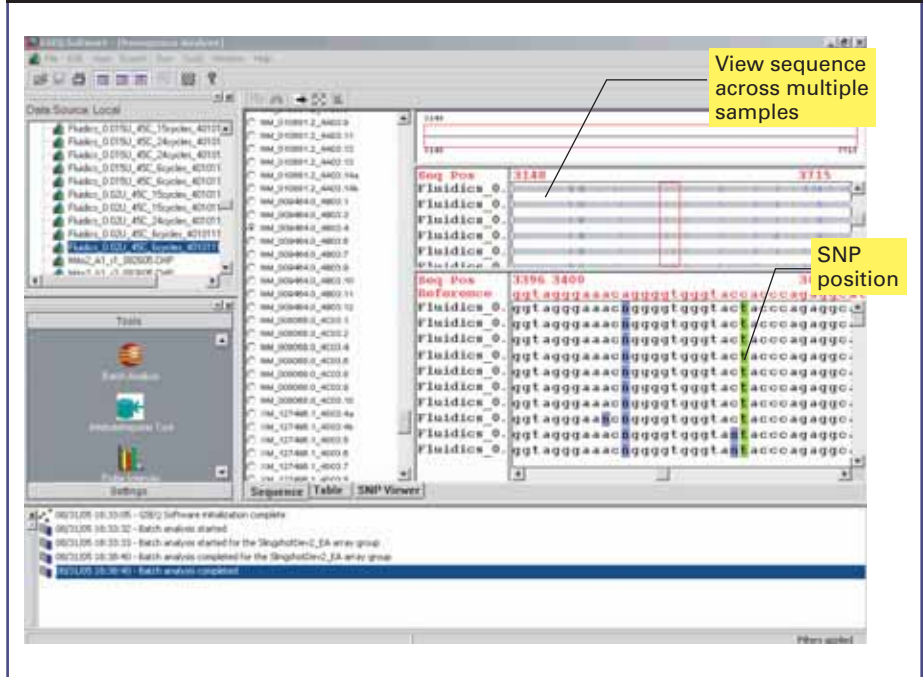
The ability to quickly resequence a microbial genome in a single experiment dramatically reduces the expense, time, and labor required using traditional sequencing methods. This efficiency enables scientists to more readily determine important genetic variations, leading to improved typing systems, vaccine candidates, and pathogen detection and identification methods. Scientists have designed CustomSeq arrays to assess variation within a single species or to differentiate between multiple species and/or strains present within a sample. Furthermore, CustomSeq arrays are capable of detecting mixtures and therefore facilitating the identification of evolving species.

### HUMAN MITOCHONDRIAL GENOME

Researchers have demonstrated the value of CustomSeq Arrays for rapid analysis of mitochondrial mutations in a variety of applications from cancer genetics to forensic identification. Using a robust long-range PCR protocol, the entire genome can be analyzed with only three PCR reactions. Additionally, the GeneChip® Human Mitochondrial Resequencing Array 2.0 is the only system capable of performing highly sensitive detection of heteroplasmy from clinical samples. The Mitochondrial Resequencing Array version 2.0 is a standard product now available through the GeneChip® Made-to-Order Program.

**Figure 2: GeneChip® Sequence Analysis Software**

GeneChip® Sequence Analysis Software (GSEQ) provides easy visualization of multiple samples and automatically identifies SNP positions.



### Critical Specifications

Format	49	100	169
Sequence Capacity	300 kb	100 kb	50 kb
Minimum Lot Size	45 +/- 5 arrays	90 +/- 5 arrays	160 +/- 5 arrays
Feature Size	8 micron		
Instrumentation	GeneChip® Scanner 3000		
Software	GeneChip® Operating Software (GCOS) 1.4 GeneChip® Sequence Analysis Software (GSEQ) 4.0		
Average Call Rates*	>90%		
Average Sequence Accuracy*	>99.9%		
Average Reproducibility	>99.9%		

\*Performance measured on representative sequence from a pure strain mouse where the heterozygosity is known to be zero. Accuracy may vary depending on sequence content and organism.

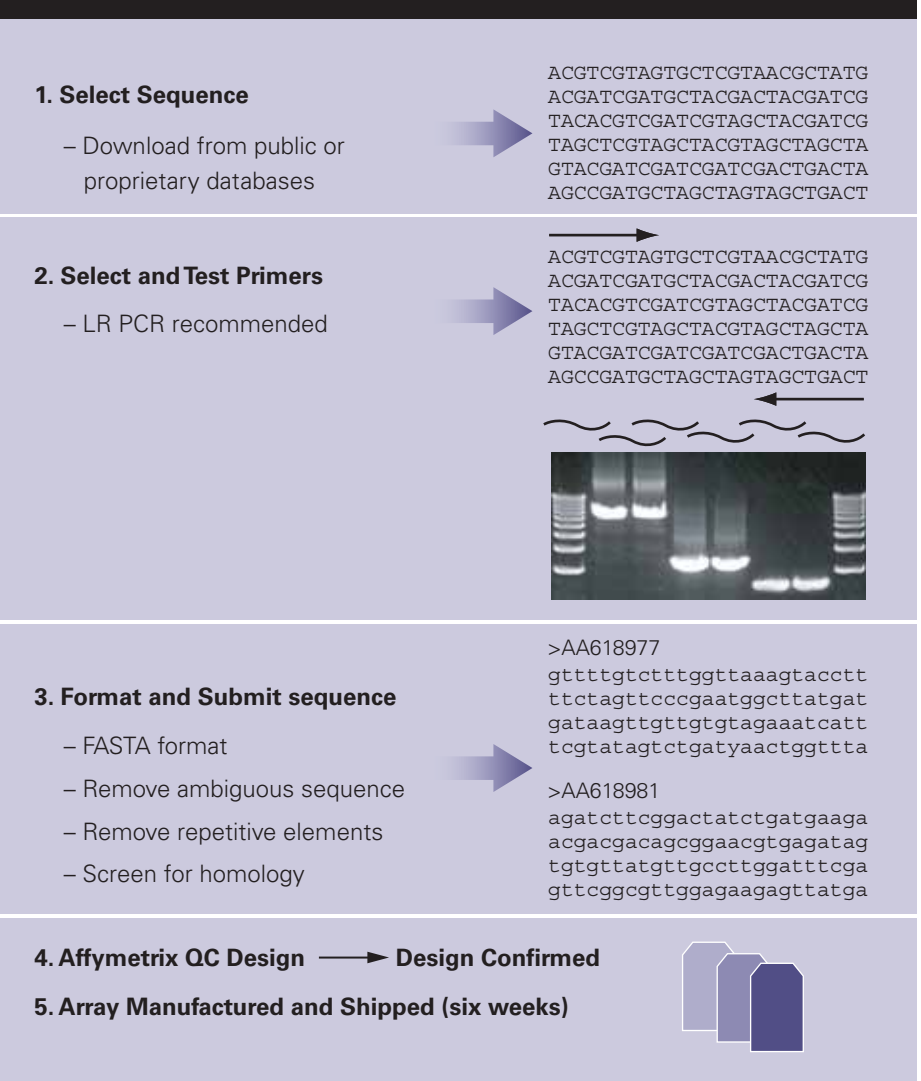
## Design and Ordering Information

Please contact your Affymetrix Account Manager to determine which array format will best suit your needs and to provide pricing for your specific project. The process for designing a custom resequencing array is described in figure 3. For detailed instructions on the preparation of your design files, please visit [www.affymetrix.com](http://www.affymetrix.com) to download a copy of the *GeneChip® CustomSeq Custom Resequencing Array Design Guide*. The Affymetrix Custom Array Design Team is also available if you require consultation about your design.

### REFERENCES

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**Figure 3: CustomSeq® Array Design Process**



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