



Data Sheet

GeneChip® CustomExpress™ Array Program

Custom GeneChip® Expression Arrays as Unique as Your Research

The GeneChip® CustomExpress™ Array Program enables you to quickly design GeneChip expression arrays tailored to your specific research needs. Whether you are following up on candidate genes from a screening study, or profiling gene expression in whole genomes not already represented on an Affymetrix® GeneChip array, CustomExpress arrays can be a powerful component of any gene expression program.

The CustomExpress program offers a wide range of expression array formats to accommodate a variety of content needs, ranging from 520 to over 61,000 sequences per array. Researchers can specifically tailor the content of their arrays by selecting both the array size and information density.

Using high-density 11 µm features, arrays can be designed with up to 1.3 million unique oligos per array. This density enhancement affords nearly three times more content than previous-generation 18 µm feature arrays. The probe density of 11 µm arrays is exclusively supported by the GeneChip® Scanner 3000 and GeneChip® Operating Software (GCOS) with high-resolution upgrades.

Imagine the Possibilities

FLEXIBLE DESIGN OPTIONS

Mix and match content from Affymetrix' commercially available GeneChip® expression arrays, or we can help you with probe selection to create an array featuring your unique or proprietary gene sequences. Select design parameters such as feature size, probe pairs per probe set, controls, and number of species represented for ultimate flexibility

QUALITY AND REPRODUCIBILITY

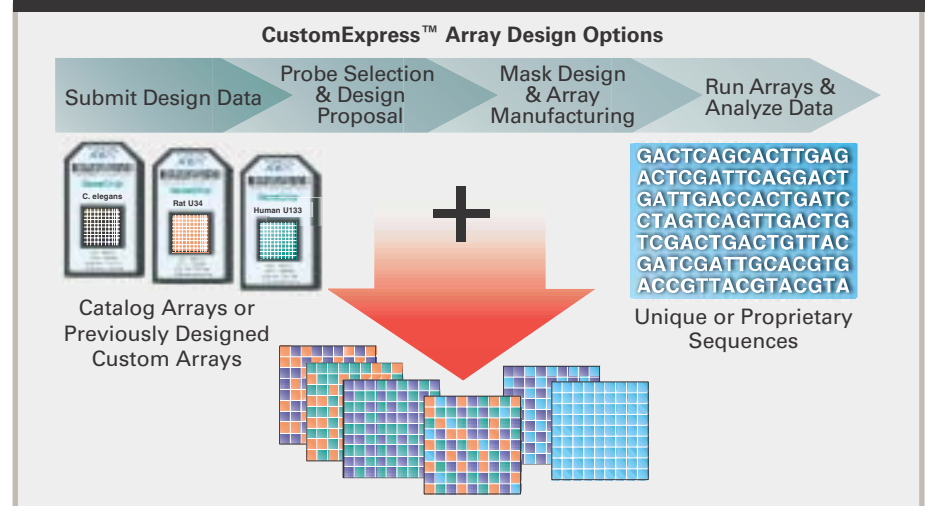
CustomExpress™ arrays are produced using the same high-quality design and manufacturing technologies as Affymetrix GeneChip catalog expression arrays. Ensure consistent, reproducible results across your gene expression studies and take advantage of our years of experience in research and development in probe selection, array

design, and manufacturing. Compare data generated with CustomExpress arrays to other catalog array experiments, or set up databases and compare results across experiments or labs, using the industry-standard technology to generate your data.

FASTER, EASIER ARRAY SOLUTIONS

The CustomExpress Array Program can make designing arrays faster and easier. Download the *CustomExpress Array Design Guide* from www.affymetrix.com to learn more about how to select sequences and begin your design. The design process is easy to follow and supported with expert consultation at every step. You can even select your probe sets and data online if your design contains content only from Affymetrix GeneChip commercial arrays. Visit the CustomExpress Design Center at www.affymetrix.com for more information.

Figure 1. Mix and match content to create a reproducible, affordable GeneChip® array specific to your needs.



DESIGN PROCESS

Submit Design Data

Please refer to the *CustomExpress Array Design Guide* for instructions about how to prepare *sequence, instruction, pruning, control files*, and the *design request form*. Once you submit your data, the Affymetrix Chip Design Group will review your data and clarify any questions.

Probe Selection and Design proposal

Probes are selected by the Affymetrix Chip Design Group using the same algorithms used to design Affymetrix GeneChip catalog arrays. Every possible probe is selected and ranked, and the best possible probe set is chosen to represent your gene sequences. A summary of probe selection with probe set quality scores comes detailed in the *Design Proposal*, which you can expect to receive one to two weeks from receipt of the sequence files. At this point you can make decisions about which probe sets you would like to synthesize on your array. Consultation is available from our Chip Design Group.

Mask Design and Manufacturing

Once you approve the *Design Proposal*, Affymetrix will design your photolithographic masks used to manufacture the arrays. You own the design and mask set. All design data are kept confidential, unless you request they be shared with others.

Once masks are completed, your arrays are manufactured to the same high-quality standards as Affymetrix catalog products. This means the arrays are quality control tested in the same manner as catalog arrays, then shipped to you with a CD containing the specific array library files (software) for analyzing your array data.

Run Arrays and Analyze Data

When you receive your arrays, follow the assay protocols contained in the *GeneChip*

Expression Analysis Technical Manual and run the arrays on the GeneChip® instrument system. Results can be mined with standard Affymetrix® software or exported for further analysis in third-party software packages. Technical support is available both at Affymetrix and through field-based applications support specialists.

Applications

CustomExpress arrays can be used for almost any gene expression application—from profiling whole genomes to focused experiments interrogating a smaller set of genes under multiple conditions or time points—to create larger, more statistically significant data sets.

Specific applications where GeneChip CustomExpress arrays have been utilized include:

- Whole-genome expression profiling
- Multiple-genome expression profiling
 - Host-pathogen interaction studies
 - Ortholog evaluation
- Drug development
 - Target identification
 - Absorption, Distribution, Metabolism, and Excretion (ADME) studies
 - Mechanism verification studies
 - Toxicology
 - Clinical research
 - Pharmacogenomics
- Pathway analysis
- Process development
- Agriculture/biotech applications
- Environmental toxicogenomics
- Gene mapping
- Genome tiling arrays

Performance

With CustomExpress arrays, you can expect the same excellent performance as Affymetrix GeneChip catalog arrays. In a recent trial, a major pharmaceutical company selected over 900 probe sets from the Human Genome U95Av2 Array for their CustomExpress design. Expression profiles for two compounds and a vehicle control were generated using CustomExpress arrays and the Human Genome U95Av2 parent arrays.

Results demonstrated CustomExpress arrays have excellent concordance with the parent catalog arrays and the results were comparable to those expected from running two different arrays of the same design (see Figure 2).

Consortia Support

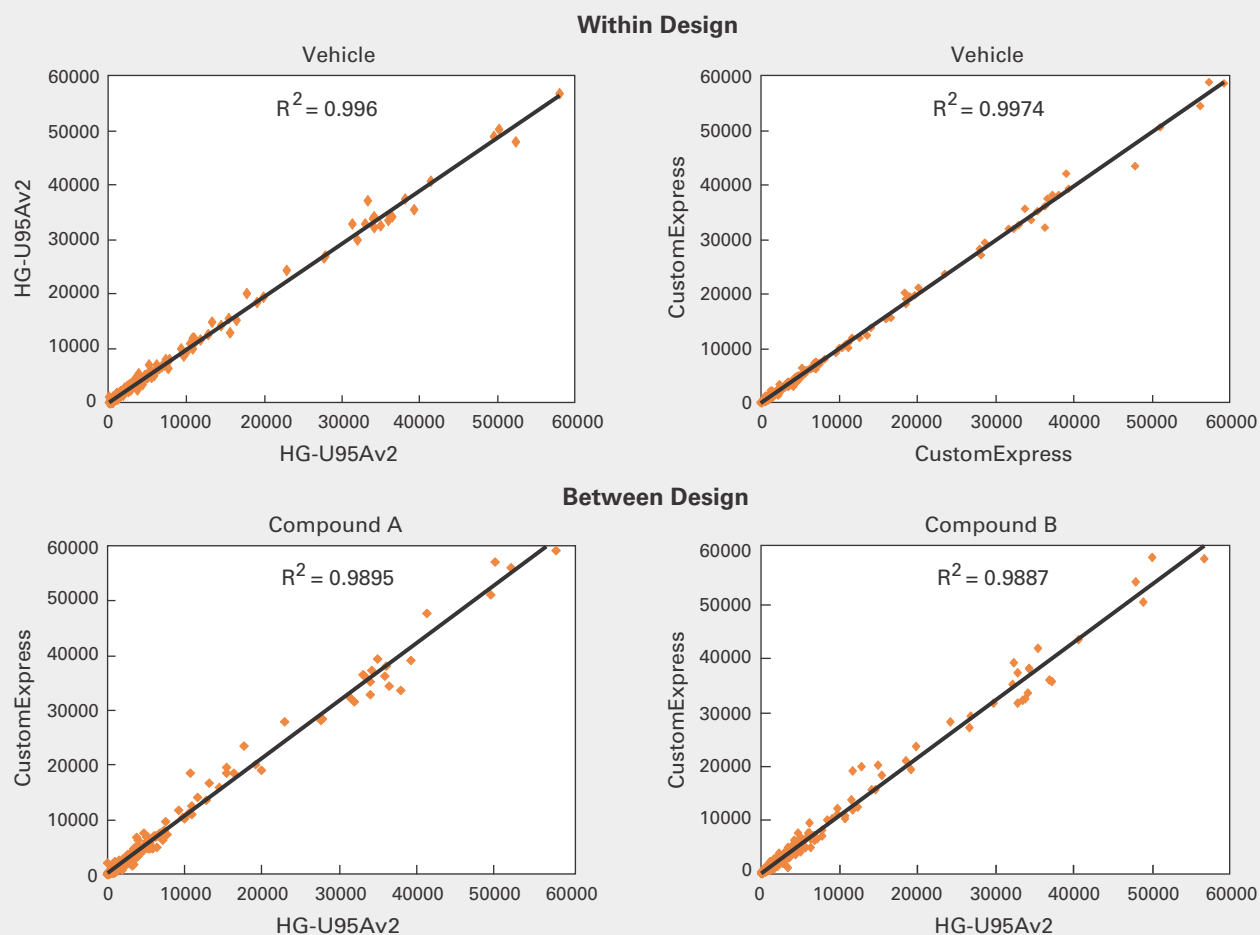
Affymetrix has been pleased to work with consortia groups to design specific arrays for their communities. Examples include the Arabidopsis ATH1 Genome Array, the *P. aeruginosa* Genome Array, the Barley Genome Array, and many more designs in process. If your research community can benefit from a CustomExpress design, please contact your Account Manager for more details.

Benefits of a Community-based Design:

- Standardize data on one platform
- Easily compare and share data
- Design reference experiments that can be accessed by your community for cost-effective comparisons of various conditions and timepoints
- Use the gold-standard microarray technology for research on your favorite genome
- Rely on the support and consultation of the Affymetrix Custom Design Team
- Unsurpassed field application support

Figure 2. Concordance results between CustomExpress™ and catalog array designs.

Expression Quantitation Concordance: CustomExpress™ Advantage and Human Genome U95Av2 Arrays



An Array of Benefits

- Flexibility
- High-quality expression profiling
- Wide variety of formats
- Ability to easily compare results
- Unsurpassed reproducibility
- Probe selection service
- Design Team available for support
- Availability of probe sequences
- Single platform for all studies
- Field support offers technical assistance

Array Format

CustomExpress Array	# Gene Sequences Represented (11 probe pairs)	
	18 μ m features	11 μ m features*
100-2187	520	1,600
100-3660	1,700	4,800
49-5241	3,600	10,100
49-7875	8,400	23,000
64	16,200	43,600
49	22,500	61,200

* 11 μ m feature size requires GeneChip® Scanner 3000 and GCOS software with high-resolution upgrades.

Specifications

Feature sizes	11* micron, 18** micron
Oligo length	25-mer
Probe pairs/gene	Minimum of 11***
Control sequences included:	
Hybridization controls	<i>bioB, bioC, bioD, and cre</i>
Poly-A controls	<i>dap, lys, phe, thr, and trp</i>
Maintenance genes	For each species represented where Affymetrix has a catalog array, the species-specific controls will be added to your design. You may specify as many additional controls as you would like.

* 11µm feature size requires GeneChip® Scanner 3000 and GCOS software with high-resolution upgrades.

** You may specify larger feature size. Feature sizes available: 18, 20, 24, and 50 µm.

*** Number of probe pairs per probe set may vary depending on original catalog array design specification or your specification for unique sequences.

Ordering Information

GeneChip® CustomExpress™ Array Program

Please visit www.affymetrix.com to download a copy of the *CustomExpress Array Design Guide* to assist you in your design strategy and preparation of your sequence files. Your Affymetrix Account Manager can help you decide which array program will best suit your needs and will provide you with a quote for your design. The Affymetrix Custom Array Design Team is available if you require consultation about your design.

To Order

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