



Providing GeneChip customers a reliable sample preparation workstation for large-scale gene expression studies*

Beckman Coulter's ArrayPlex application has earned Affymetrix Premier Application Status. This provides to GeneChip customers a reliable sample preparation workstation for large-scale gene expression studies that meets Affymetrix' validation specifications.

ARRAYPLEX

APPLICATION FOR MICROARRAY
TARGET PREPARATION

Featuring
Affymetrix Premier* Application
Provider Status

HIGHER THROUGHPUT

Automated target RNA sample processing in 36 hours — six times that of a single technician holding a manual pipettor.

- Eliminate pipetting errors
- Improve consistency

SCALABILITY

- Process experimental and control samples in batches of eight, up to 96 in a full microplate
- Application available on smaller-footprint Biomek® 3000

FLEXIBILITY

- Filtration or magnetic bead cleanup steps
- Compatible with both Affymetrix and Enzo IVT labeling reagents

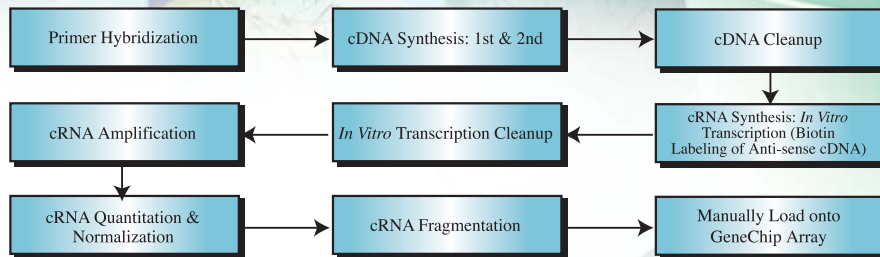
RELIABILITY

- Fully validated robust solution
- Increased performance of GeneChip hybridization
- ArrayPlex is distributed and supported by Beckman Coulter, assuring world-class service and support

VERSATILITY

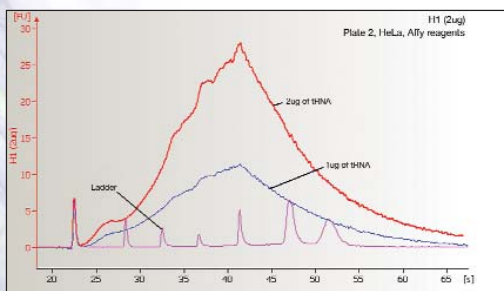
- Automated methods to provide for all your nucleic acid preparation and cleanup needs are available from Beckman Coulter

WORK-FLOW FOR TARGET RNA PREP ON THE ARRAYPLEX

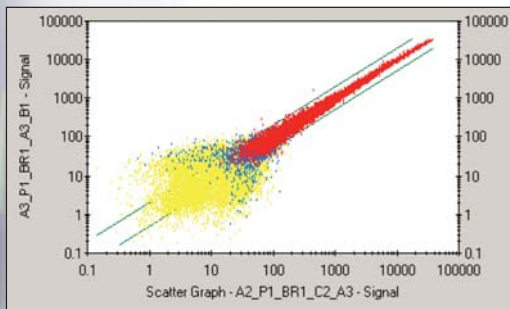


AFFYMETRIX PREFERRED APPLICATION PROVIDER STATUS

To satisfy Affymetrix acceptance criteria, two operators on different instrument platforms were required to process 1 and 2 µg aliquots of total RNA isolated from HeLa cells. A total of 240 samples were processed using Affymetrix brand cDNA and IVT reagents. Reaction cleanup was done by filtration using Qiagen MinElute* and RNeasy cleanup kits. The quality of the cRNA product was determined by hybridization of a random sample to 60 Human U133 plus 2 Gene Chips. A summary of the data is shown below.

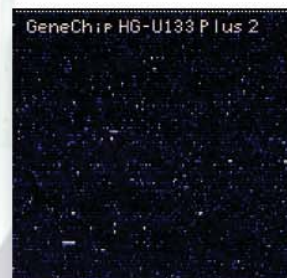


BioAnalyzer Electropherogram: cRNA size distribution generated during automated processing of 1 µg and 2 µg total RNA samples



Log correlation analysis between replicates of HeLa samples at 1µg target level generated using GCOS 1.2. Green parallel lines indicate two-fold change

Affymetrix Human U133 plus 2 GeneChip cartridge scan of HeLa total RNA



Summary table of results from 60 GeneChips analyzed. The ArrayPlex generated the quantity and quality of target RNA necessary to meet the acceptance criteria for each of the parameters set by Affymetrix

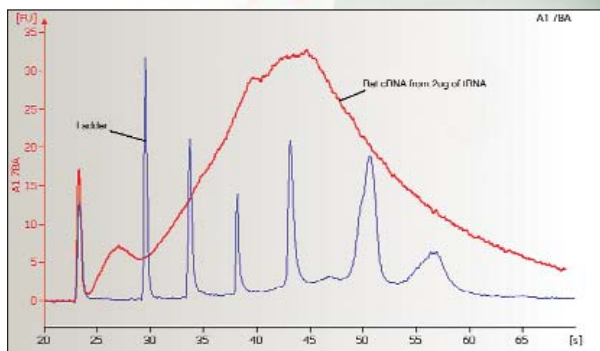
PARAMETER	ACCEPTANCE CRITERIA	OBSERVED (% CV)	PASS/FAIL
Yield (1 µg target)	> 25 µg	32 µg	Pass
Yield (2 µg target)	> 25 µg	52 µg	Pass
% Present	> 53 (< 5%)	55.3 (2.3%)	Pass
β-Actin 3'/5' ratio	(< 10%)	1.5 (8.2%)	Pass
GAPDH 3'/5' ratio	(< 10%)	0.99 (2.7%)	Pass
% False Change	0.75	0.28	Pass
Pearson Correlation	0.94 - 0.96	0.94	Pass

ARRAYPLEX ENABLES NEWLY TRAINED NIDDK TECHNICIAN TO SCORE AT THE TOP OF THE 18-LAB PEER PROFICIENCY STUDY

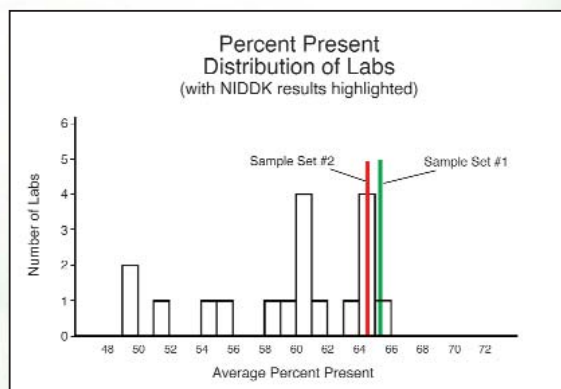
NATIONAL INSTITUTES OF HEALTH (NIH) INSTRUMENT QUALIFICATION STUDY

For the NIH qualification study, target prep was done by a newly trained NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases) technician on the ArrayPlex using two sets of six rat total RNA samples (isolated from tissue pools). A total of 12 samples were processed using Affymetrix cDNA and ENZO IVT reagents. Reaction cleanup was done by filtration using Qiagen MinElute and RNeasy cleanup kits. The quality of the cRNA product was monitored by an outside evaluator, Expression Analysis, Inc., who determined the lab performed at the top of the 18-lab peer proficiency study (see below).

*BioAnalyzer Electropherogram:
cRNA size distribution
generated from 2 µg total
RNA rat tissue pools*



*Graphical representation of
how the NIDDK lab performed
in comparison to the 18-lab
peer proficiency study reviewed
by Expression Analysis, Inc.*



*Summary table of results
from two sets of 6 GeneChips
analyzed using target RNA
generated on the ArrayPlex*

MEASUREMENT (LAB AVERAGE)	SAMPLE SET #1	SAMPLE SET #2	PEER AVERAGE
Noise	2.00	2.01	2.40
GAPDH 3'/5' ratio	1.04	1.09	1.45
β-Actin 3'/5'	2.02	2.07	2.94
% Present	65.4	64.6	59.5
Signal Present	992	1016	1057
False Positives	1.24%	1.48%	2.56%

WHY AUTOMATE?

- Eliminate pipetting errors
- Scalable processing
- Improve GeneChip data reproducibility

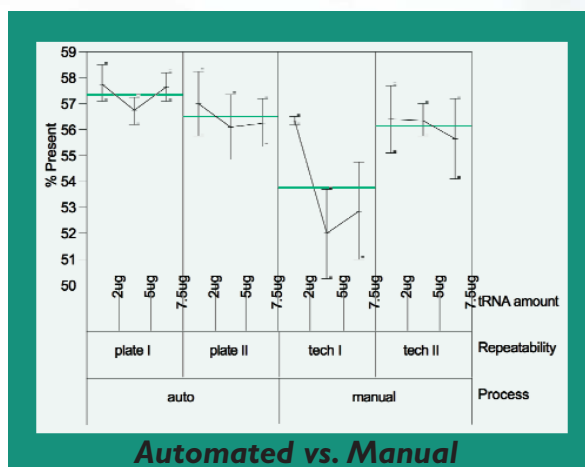
ARRAYPLEX VALIDATION STUDY

The ArrayPlex validation study was initiated to identify sources of variation in target RNA prep by comparison of one operator on the ArrayPlex vs. two skilled laboratory technicians performing the process manually. The commercially available Human Reference RNA product from Stratagene (San Diego, CA) was used as the source of total RNA. The samples were processed using Invitrogen cDNA and ENZO IVT reagents, both manually and on the automation platform. A total of 12 samples from each picked for comparison by hybridization to 24 Human U133 Plus 2 GeneChips. The results are shown below.

MEASUREMENT (AVERAGE)	AUTOMATED		MANUAL	
	Plate 8 wells	Plate 96 wells	Technician 1	Technician 2
Background	44.2	54.5	43.9	44.7
GAPDH 3'/5' ratio	0.89	0.87	0.88	0.88
β -Actin 3'/5'	1.01	0.99	1.21	1.13
% Present				
2 g	57.8	57.1	56.4	56.4
5 g	56.8	56.2	52	56.4
7.5 g	57.7	56.3	52.9	55.7
Signal Present	790	791	802	800

Summary table of averaged results from each set of 6 GeneChips analyzed using target RNA generated from either automated or manual processing methods. Variation in target RNA prep is revealed in the ANOVA (right).

ANOVA OF AFFYMETRIX HUMAN U133 PLUS 2 GENECHIP PERCENT PRESENT



ORDERING INFORMATION

For ordering and additional information, please contact your local Beckman Coulter representative or visit our web site at:

www.beckmancoulteremail.com/arrayplex

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Beckman Coulter, Inc. • 4300 N. Harbor Boulevard, Box 3100 • Fullerton, California 92834-3100
Sales & Service: 1-800-742-2345 • Telex: 678413 • Fax: 1-800-643-4366 • www.beckmancoulter.com

Worldwide Biomedical Research Division Offices:

Australia (61) 2 9844-6000 Canada (905) 819-1234 China (86) 10 6515 6028 Eastern Europe, Middle East, North Africa (41) 22 994 07 07
France 01 49 90 90 00 Germany 49 21 513335 Hong Kong (852) 2814 7431/2814 0481 Italy 02-953921 Japan 03-5404-8359
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