

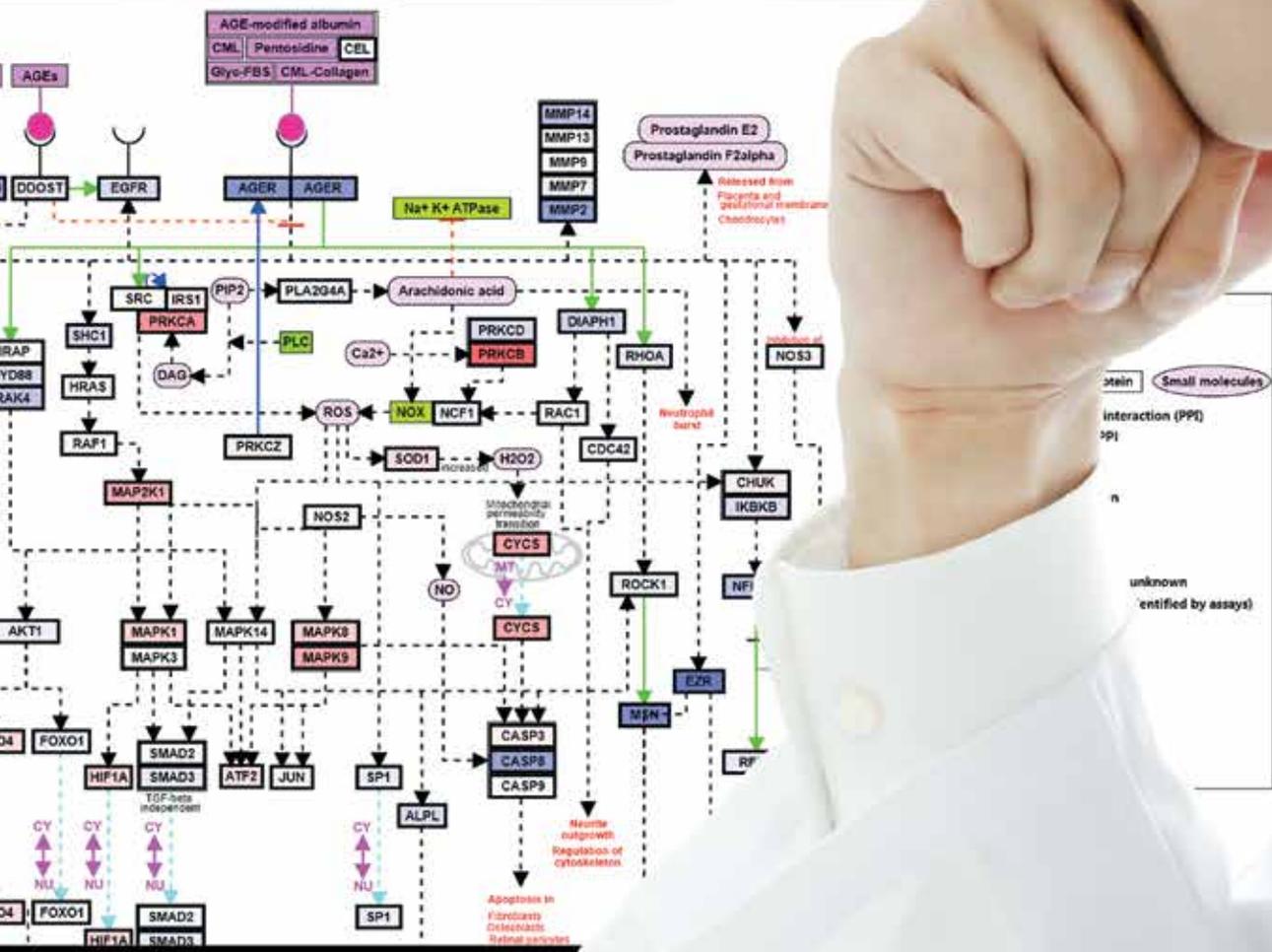
appliedbiosystems



Gene expression microarrays and assays

Because your results can't wait

ThermoFisher
SCIENTIFIC



A simple path from data to decision-making

The power of expression microarrays

Transcriptome-wide analysis can be complex. Matching your experimental requirements to the most appropriate tool can streamline your study, thereby reducing time-to-results and simplifying analysis. Expression microarrays (arrays) simultaneously measure expression levels of thousands of RNA transcripts. They're ideal for scientists who want to quickly and easily find expression differences between biological groups. With a history of over 20 years, Applied Biosystems™ array technology has proven to be extremely reproducible, reliable, sensitive, and accurate. Combined with our novel reagents for challenging, precious samples and intuitive analysis software, our solutions allow you to go from sample to insights in just three days.

The ideal solution for large projects

Arrays have fueled the discovery of thousands of disease biomarkers, significantly advanced our understanding of biological mechanisms, and continue to accelerate the translation of biomarker signatures into routine tests.

Our arrays are well suited for whole-transcriptome profiling and for studies of organisms whose genomes have been sequenced. Leveraging multiple sequence data sources, our arrays provide comprehensive coverage of known genes and transcripts across the transcriptome. Fast analysis, reproducible results, scalable formats, and affordability make our arrays the ideal option for expression analysis of large numbers of samples.

Highly reproducible results

Applied Biosystems™ Clariom™ and GeneChip™ high-density arrays each contain millions of copies of DNA oligonucleotide probes that are designed to bind specific sequences of target RNA to measure its relative amount across sample groups. Unlike print or bead array technologies, our technology synthesizes multiple independent probes per target RNA onto quartz glass using photolithography—an extremely precise and reproducible process that yields very low array-to-array variability. This process enables highly reproducible results and confidence in your data.

For a fast path to important insights, even from challenging and precious samples, power your expression studies with Applied Biosystems™ expression arrays and assays.



Arrive at important insights, faster

An array for each experiment

For fast RNA expression analysis, we offer a complete range of arrays for whole-transcriptome-, gene-, exon-, or short noncoding (snc)RNA-level analysis (Figure 1). All of our expression arrays are compatible with a wide variety of sample types and accommodate low RNA input. They are available in single-sample array cartridge and multi-sample array plate formats for different throughput needs. They all include our fast, flexible analysis software at no additional cost.

Probe coverage across the transcript for each array type

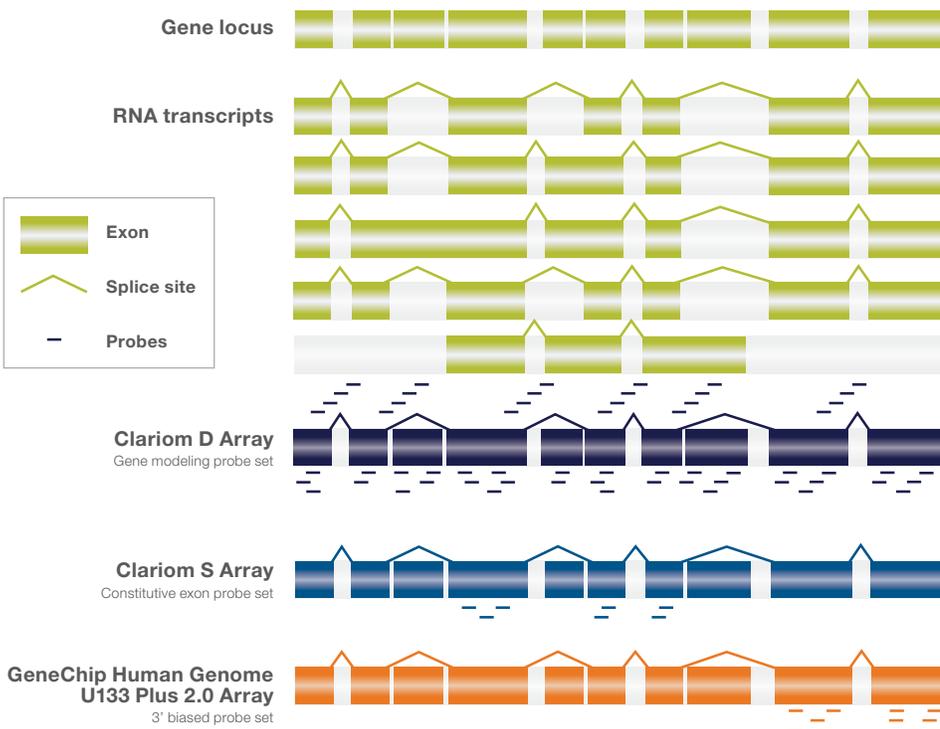


Figure 1. The “Gene locus” bar (green) represents one entire gene. The five “RNA transcripts” bars (green) represent multiple transcript isoforms, segmented into exons, with splice sites represented by peaks. The short dashes associated with each array type indicate the probe coverage for that array. The Applied Biosystems™ Clariom™ D Array has the most comprehensive coverage, detecting all known genes, exons, and splice variants. The Applied Biosystems™ Clariom™ S Array detects constitutive exons—those exons expressed in all known, well-annotated transcript isoforms of the gene. The Applied Biosystems™ GeneChip™ Human Genome U133 Plus 2.0 Array detects exons at the 3′ end of the gene only.

Assay kit name

Application(s)

Level of analysis

FFPE tissue-compatible

RNA input minimum

Part of gene measured

Available format(s)

Available species

Assay kit includes

Instrument (array format)

At a glance: Applied Biosystems RNA expression microarray portfolio

	Clariom D Assay	Clariom D Pico Assay	Clariom S Assay	Clariom S Pico Assay	GeneChip Human Genome U133 Plus 2.0 Assay	GeneChip Human Genome U133 Plus 2.0 Pico Assay	GeneChip miRNA 4.0 Assay
	Deep and broad transcriptome analysis and biomarker discovery		Gene-level expression profiling of well-annotated genes		3'-biased basic gene-level expression analysis in the context of extensive published studies		Comprehensive miRNA profiling to identify miRNA biomarkers
	Coding and noncoding genes, exons and alternative splicing, including both well-annotated and speculative transcripts		Well-annotated genes		Annotated genes		Pre- and mature miRNA, snoRNA, scaRNA
	No	Yes	No	Yes	No	Yes	Yes
	50 ng	0.1 ng (0.5 ng for FFPE)	50 ng	0.1 ng (0.5 ng for FFPE)	50 ng	0.1 ng (0.5 ng for FFPE)	130 ng
	Whole transcript				3' end		Whole transcript
	Cartridge (single sample)		Cartridge (single sample) Array plates (24 or 96 samples)				
	Human, mouse, rat				Human (equivalent arrays for mouse, rat, and other species are available)		Includes 203 species on a single array
	<ul style="list-style-type: none"> Clariom D Array GeneChip WT PLUS Reagent Kit 	<ul style="list-style-type: none"> Clariom D Array GeneChip WT Pico Kit 	<ul style="list-style-type: none"> Clariom S Array GeneChip WT PLUS Reagent Kit 	<ul style="list-style-type: none"> Clariom S Array GeneChip Pico Kit 	<ul style="list-style-type: none"> GeneChip U133 Plus 2.0 Array GeneChip IVT PLUS Reagent Kit 	<ul style="list-style-type: none"> GeneChip U133 Plus 2.0 Array GeneChip Pico Kit 	<ul style="list-style-type: none"> GeneChip miRNA 4.0 Array FlashTag Biotin HSR RNA Labeling Kit
	GeneChip Scanner 3000 7G System (cartridge)		GeneChip Scanner 3000 7G System (cartridge) GeneTitan Multi-Channel (MC) Instrument (plates)				

Find answers, move on

Next-generation transcriptome profiling assays

Quickly reveal critical biomarker signatures from coding and long noncoding (lnc)RNA to yield key insights into the complexity of biology with whole-transcriptome array analysis. Applied Biosystems™ Clariom™ D and Clariom™ S assays (for human, mouse, and rat) are designed for whole-transcriptome expression profiling and biomarker discovery. Built using the latest transcriptomic knowledge from multiple sequence data sources, they are ideal tools to identify new RNA biomarkers.

Use as little as 100 pg total RNA input from a wide variety of sample types, including cells, fresh/fresh-frozen and formalin-fixed, paraffin-embedded (FFPE) tissues, and whole blood. There's no need to remove globin mRNA or rRNA—which helps preserve sample integrity and reduces data variability.

Clariom D Assay and Clariom D Pico Assay

- Accelerate biomarker discovery with deep and broad transcriptome analysis
- Obtain comprehensive transcriptome-wide, gene- and exon-level expression profiles, including detection of rare and low-abundance transcripts
- Reveal alternative splicing events of both coding and lncRNA isoforms

Clariom S Assay and Clariom S Pico Assay

- Quickly assess changes in key genes and pathways to identify gene-level biomarker signatures
- Detect only constitutive exons of well-annotated genes to provide an unbiased view of gene expression uncomplicated by variation in expression of transcript variants
- Available in scalable formats for small and large studies



Unlock the secrets of short noncoding RNA

Short noncoding (snc)RNA assays

Many diseases, including cancer, have been linked to aberrant regulatory networks involving sncRNA expression. Identify miRNA, snoRNA, and scaRNA biomarkers with transcriptome-wide sncRNA array analysis. The Applied Biosystems™ GeneChip™ miRNA 4.0 Assay (for human, mouse, rat, and more than 200 other species) enables complete profiling of known sncRNAs to better understand disease mechanisms and identify new sncRNA biomarkers.

GeneChip miRNA 4.0 Assay

- Comprehensive profiling of pre- and mature miRNA, snoRNA, and scaRNA
- Use as little as 130 ng total RNA with no need for miRNA enrichment
- Compatible with FFPE tissues and whole blood with no need for globin mRNA reduction



Figure 2. TAC Software miRNA-mRNA network view. Red rectangle in the center of the image shows upregulation of miRNA hsa-miR-383-5p and its relationship to multiple genes (represented by ovals) and their relative expression levels.

Your content. Your design. Your array.

Custom arrays for specialized needs

We offer catalog arrays for over 25 different species, but sometimes you may require a more tailored approach. Our custom expression array program gives you the power to create the exact array you need.

Well-suited for complex genomes or designs, our custom arrays enable you to define the content needed

for your species of interest from either our off-the-shelf arrays or your own RNA-Seq data, or both. Tell us the array format and type of design you want, or we can advise you on what best fits your objective. Our experienced bioinformaticians design your probes, and we build your very own array.

Don't wait for answers

Simple, fast analysis software

Data analysis is central to effective expression studies, but specialized bioinformatics often leaves you waiting for answers. Take data analysis into your own hands and reduce the amount of time you spend waiting for results.

Applied Biosystems™ Transcriptome Analysis Console (TAC) Software

Transform raw data to insights in just minutes. With TAC Software, you can quality control (QC), normalize, summarize, and analyze data quickly and easily.

Go beyond expression summaries to produce interactive visualizations of complex pathways, miRNA and target gene interactions, and alternative splicing events.

Designed for the biologist, TAC Software is based on standardized workflows for gene- and exon-level analysis, allowing you to conduct your own detailed analyses without specialized bioinformatics resources.

TAC Software is included with all of our expression arrays and assays at no additional cost.

Check your samples

- Flag outlier samples based on configurable QC metrics
- Group sample sets with common expression patterns using principle component analysis (PCA) and exploratory group analysis (EGA)
- Remove batch effects to reveal true biology

Find important expression patterns

- Identify differentially expressed genes, exons, splice variants, and sncRNA
- Link directly to publicly available annotations

Find answers

- View data in multiple interactive visualizations, including scatter, volcano, and hierarchical clustering plots
- Identify significantly changed pathways via WikiPathways integration



TAC Software alternative splicing view.

Applied Biosystems™ GeneTitan™ Multi-Channel (MC) Instrument

The GeneTitan MC Instrument is a fully automated, high-throughput system for processing large numbers of arrays in plate format (24- and 96-array plates) with minimal hands-on time. This benchtop unit, suitable for high-productivity labs, automates array processing from target hybridization to data generation.

For end-to-end automation, robotic sample preparation is available with the addition of the Biomek™ FX[®] Target Prep Express (Beckman Coulter Inc.) instrument to your lab.

- Medium- to high-throughput expression and genotyping analysis
- Condenses hands-on time to as little as 30 minutes and can be operated unattended overnight



Applied Biosystems™ GeneChip™ Scanner 3000 7G System

The GeneChip Scanner 3000 7G System is a well-established array-processing system for array cartridges. This modular system includes separate components for the manual array-processing workflow. Proven over many years of reliable use, the GeneChip Scanner 3000 7G System delivers high performance for a wide range of applications.

- Low- to medium-throughput expression, sncRNA, and copy number variation analysis
- Combine with the Applied Biosystems™ GeneChip™ AutoLoader to enable sample tracking and temperature control for walk-away array scanning



Increase your lab's productivity and efficiency

Comprehensive service and support for when you need an expert.

Comprehensive instrument warranty

Our factory-trained and certified field service engineers (FSEs) are focused on delivering the highest quality of workmanship. During the warranty period, repairs, including engineer time and travel, are covered.

Service and support plans

We provide comprehensive post-warranty support to help you maintain productivity, maximize the value of your investment, and optimize performance with professional consulting services.

Benefits of service and support plans include:

- Flexible and configurable support solutions
- Prioritized response based on your business demands
- Optimum reliability via scheduled preventive system maintenance
- Optimum workstation performance and latest software updates
- Lower operating cost for arrays and reagents lost due to instrument failure
- Discounted optional services and support products (varies by region)
- Predictable operating cost

How to reach us

To find your local support or technical support team, go to [thermofisher.com/contactus](https://www.thermofisher.com/contactus)

For product FAQs, protocols, training courses, and webinars, go to [thermofisher.com/technicalresources](https://www.thermofisher.com/technicalresources)



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Your complete solution for RNA expression profiling

Accurate analysis is now fast and easy

Your research can't wait. Arrays are fast, simple, reliable, and affordable. Access millions of annotated and unannotated sequences for biomarker identification and expression profiling. Gain insights into coding and noncoding genes, exons, and splice variants.

Our array solutions are compatible with challenging, precious sample types, and are scalable for low- and high-throughput studies. With TAC Software included at no additional cost, you can make even the most complex analysis challenges easy.

Applied Biosystems arrays and assays help provide you with a faster path to the important insights you're seeking.

Find out more at [thermofisher.com/microarrays](https://www.thermofisher.com/microarrays)

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