



Digital PCR

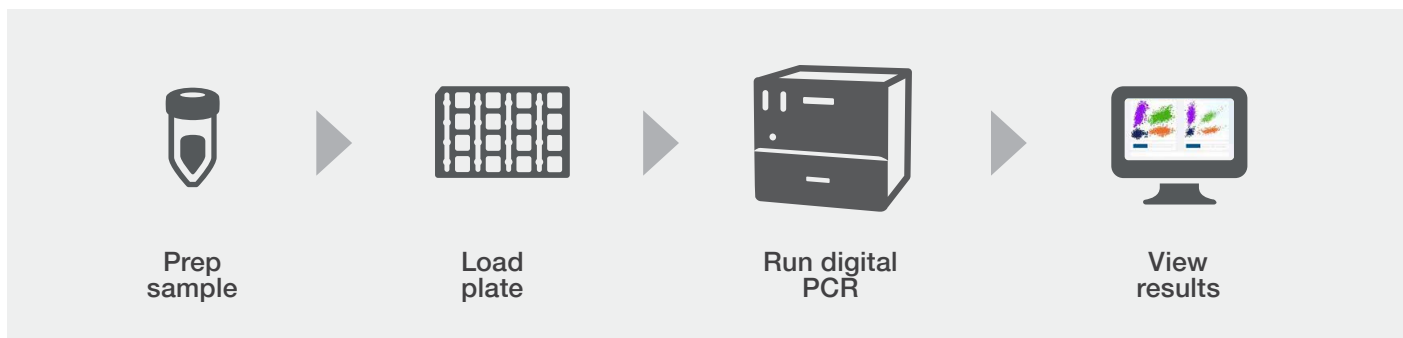
QuantStudio Absolute Q Digital PCR System

Where consistency meets simplicity

applied biosystems

Digital PCR, simplified

The Applied Biosystems™ QuantStudio™ Absolute Q™ Digital PCR System integrates all the necessary steps for [digital PCR \(dPCR\)](#)—compartmentalization, thermal cycling, and data acquisition into a single instrument. Simply pipette the reaction mixture into the microfluidic array plate (MAP) and let the QuantStudio Absolute Q system take care of the rest. You get the benefits of dPCR, with the familiar workflow of real-time PCR (qPCR).



The benefits of dPCR and why they matter

The [QuantStudio Absolute Q dPCR System](#) provides the following benefits with elegant simplicity:



Rare target analytical sensitivity

- dPCR excels in the ability to detect unique targets from more abundant wild-type sequences
- Important for research in gene editing, oncology, inherited diseases, cell and gene therapy, and more



Robustness against PCR inhibition

- Compartmentalization of samples also dilutes impurities that may inhibit PCR, making dPCR quite robust
- Important for environmental surveillance, wastewater monitoring for bacteria or viruses, or analysis of formalin-fixed, paraffin-embedded (FFPE) samples



High precision

- Accuracy and reproducibility of sample division into microreactions enables high precision by reducing variability caused by amplification efficiency or user error
- Important for gene expression analysis, copy number variation, CAR T cell monitoring, and more



Quantification of low-abundance targets

- High sensitivity of dPCR, combined with TRUE background subtraction and false positive rejection make the QuantStudio Absolute Q system an excellent choice for confident ultra-low concentration targets
- Important for oncology research, liquid biopsy analysis, residual DNA quantification, pathogen detection, and more



Absolute quantification

- Compartmentalization into microreactions helps enable precise copy number measurements without the need for standard curves
- Important for research in gene bioproduction, cell and gene therapy, viral titers, and more



Molecule-specific analysis

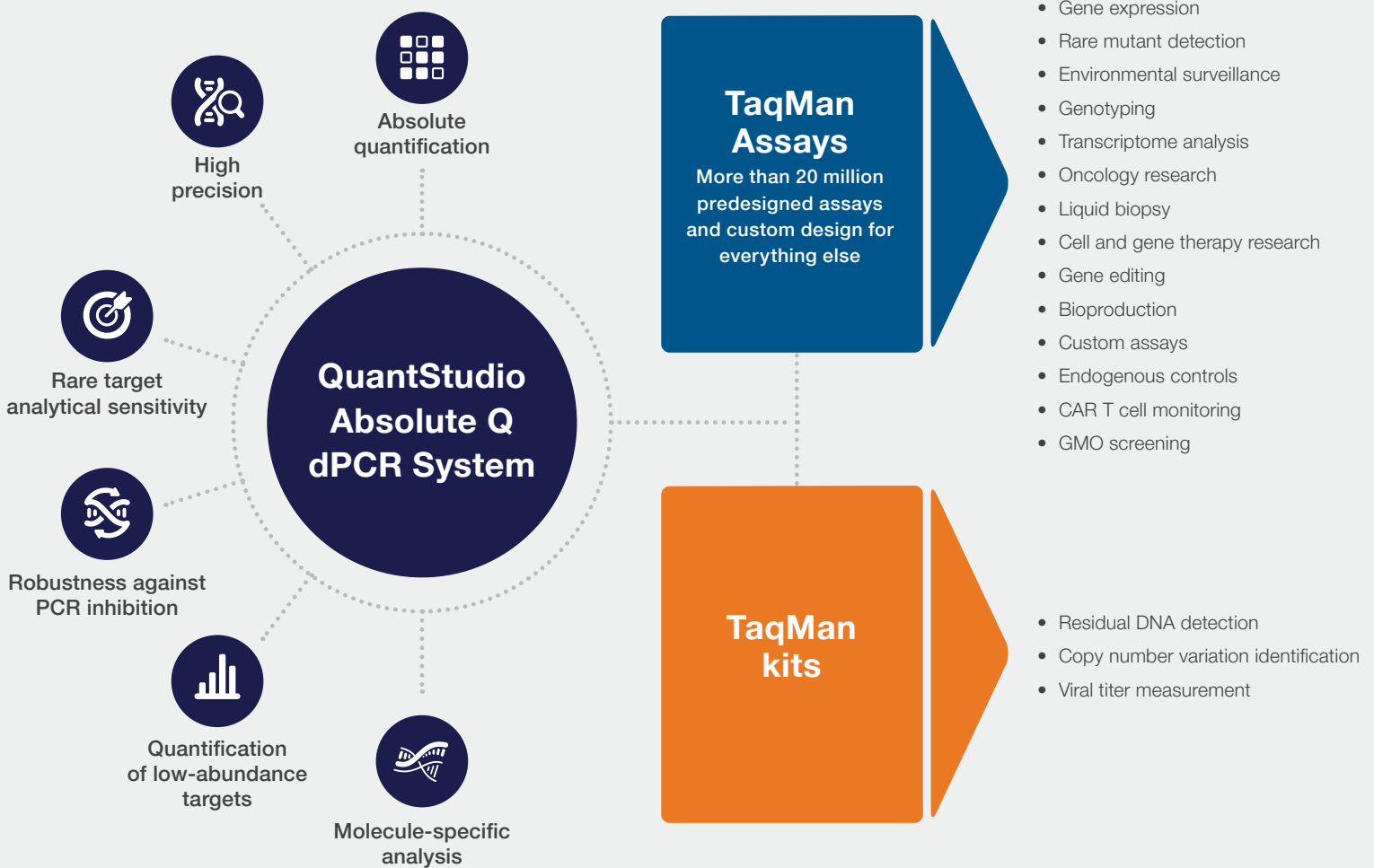
- Primer design is the only limitation on how specific your dPCR results can be; if you do it in qPCR, you can do it in dPCR too
- Important for research in cell and gene therapy, mRNA production, viral titer, and more

Precision with kits and assays for virtually every application

dPCR helps enable exceptional precision and versatility for diverse applications. Beyond its simple workflow, the QuantStudio Absolute Q system further elevates dPCR technology by leveraging Thermo Fisher Scientific's extensive portfolio of [Applied Biosystems™ TaqMan™ Assays and kits](#), enabling easy integration with confidence into virtually any research area and application.

TaqMan chemistry, cited in more than 296,000 peer-reviewed publications

- Trusted 5' nuclease qPCR assays providing high analytical specificity, sensitivity, and reproducibility
- More than 20 million predesigned assays
- Coverage for more than 30 species
- Multiple locations per transcript available



Download at thermofisher.com/dpcr

Intelligently integrated

dPCR overcomes variability and low accuracy by eliminating the need for a standard curve. The QuantStudio Absolute Q Digital PCR System consists of just one instrument, consolidating all steps required into a single plate and transforming a multi-step, multi-instrument workflow into a familiar one-step, qPCR-like workflow that can deliver results in as little as 90 minutes.



Absolute potential

A modern implementation of dPCR, capable of getting the most from your precious samples and supporting innovative applications.

Rare target results you can trust

- True background subtraction and false positive rejection make the QuantStudio Absolute Q system an excellent choice for detecting ultra low-concentration targets with confidence

Achieve the analytical sensitivity you need

- 20K microchambers per reaction with >99% accepted per reaction
- Digitally pool thousands of microchambers across reactions and plates to boost analytical sensitivity

Precision over a broad dynamic range

- $\pm 10\%$ precision
- 5 logs dynamic range

Multiplex up to five optical channels

- Blue (Applied Biosystems™ FAM™ dye)
- Green (Applied Biosystems™ HEX™ dye or VIC™ dye)
- Yellow (Applied Biosystems™ ABY™ dye)
- Red (Applied Biosystems™ JUN™ dye)
- Dark red (Cy5® dye)

Fingertip access

Applied Biosystems™ QuantStudio™ Absolute Q™ Digital PCR Software has been designed with the intention of enhancing productivity and helping to minimize the likelihood of user error, along with features for oncology and measurable residual disease (MRD) research workflows.

Improved efficiency

- Faster analysis with streamlined setup and preset thresholding

Enhanced analysis features

- Automated steps remove bias to aid interpretation of important metrics with integrated calculations
- Standardized variant allele frequency (VAF) analysis helps save time reviewing and interpreting results

Informative quality control (QC) tools

- Deeper insights and simple report generation with QC flags and transparent override flexibility

Scalable support for batch and study analysis

- Group samples from multiple plates to analyze and report results with one click

Flexible configurations

Scale your dPCR with efficiency and ease with **Applied Biosystems™ QuantStudio™ Absolute Q™ AutoRun dPCR Suite**. Easy-to-use, walk-away workflow support lets you reclaim your valuable time.

Learn more at thermofisher.com/autorun



Continue learning

Still not sure how dPCR fits into your research or how it complements endpoint PCR and qPCR? Our e-book covers how all three PCR technologies work together.

Access our e-book at thermofisher.com/pcrebook

TaqMan chemistry for dPCR

The QuantStudio Absolute Q Digital PCR System and Applied Biosystems™ master mixes are powered by trusted TaqMan technology, which means that if you can do your analysis with qPCR, you can do it with dPCR.

Spend your time generating results with TaqMan Assays and kits, not designing and optimizing assays

- Simple, fast, and dependable with proven 5' nuclease and probe-based technology
- More than 20 million professionally designed, preoptimized, performance guaranteed* assays
- [Custom design tool](#) and [custom dPCR assay design services](#) options to support new and innovative targets
- Endogenous controls for common housekeeping genes

Species	Number of pre-designed assays
Human (<i>H. sapiens</i>)	>330,000
Mouse and rat	>409,000
Other vertebrates, bacteria, viruses, plants, and more	>2,000,000
Summary	>2,800,000

Enabling technology

Proprietary [MAP technology](#) is at the heart of the QuantStudio Absolute Q dPCR System and its ability to deliver reliable consistency.

Your sample is pipetted into the MAP16 plate, a microinjection molded plate, where it remains, unmoved, for compartmentalization, thermal cycling, and data acquisition.

Use of MAP technology offers significant advantages over other dPCR sample digitization methods:

- Confidence in sensitivity with advanced false positive rejection and true background subtraction
- >95% input analyzed; <5% wasted sample
- Exceptional [consistency](#) and accuracy with >99% of available microchambers filled
- Simple workflow that is compatible with TaqMan Assays and qPCR workflows

The mix

PCR cannot happen without a polymerase enzyme and master mix. The QuantStudio Absolute Q system uses dPCR master mixes formulated using trusted polymerases, reverse transcriptases, and other components.

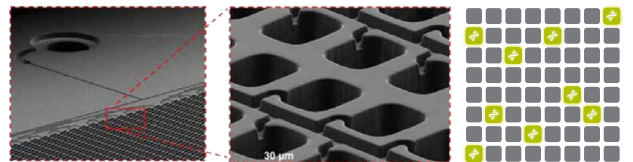
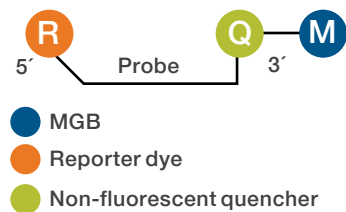
[Applied Biosystems™ Absolute Q™ Universal DNA Digital PCR Master Mix \(5X\)](#)

- Compatible with over 20 million TaqMan Assays and kits
- 72-hour room temperature stability for convenience and improved automation

[Applied Biosystems™ Absolute Q™ 1-Step RT-dPCR Master Mix \(4X\)](#)

- Support for RNA-based applications





* [Terms and conditions apply. For complete details, click here.](#)



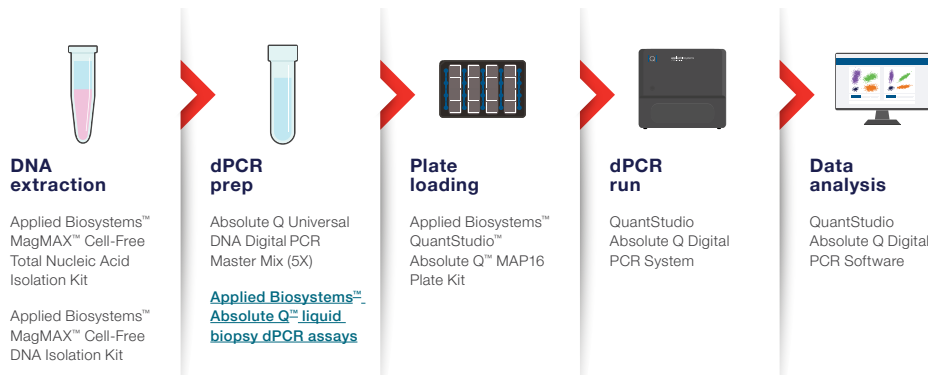
Research in oncology and liquid biopsy—an example application

Cell-free DNA (cfDNA), released from necrotic and apoptotic cells, is a valuable potential source of tumor-derived DNA. Because cfDNA can be obtained from liquid biopsies, it represents a noninvasive way to identify and track oncogenic mutations and other cancer-related biomarkers. Characterizing cfDNA found in liquid biopsies helps researchers detect cancer, quantify tumor burden, and measure and monitor therapeutic response.

dPCR, with its high analytical sensitivity, is better suited for rare target detection compared to conventional methods. It can [precisely quantify cfDNA and circulating tumor DNA \(ctDNA\)](#), which are usually present in low concentrations. dPCR can not only detect rare targets, but also distinguish rare targets from more abundant wild type counterparts with similar sequences.

-  Absolute quantification
-  High precision
-  Rare target analytical sensitivity
-  Robustness against PCR inhibition
-  Quantification of low-abundance targets
-  Molecule-specific analysis

Example workflow



The QuantStudio Absolute Q system workflow, for this and other applications, is familiar and very similar to a qPCR workflow where you prep your sample, load it into your plate, and let a single instrument take care of the rest.

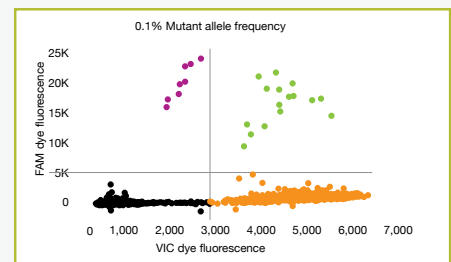
Familiar, qPCR-like workflow

Single instrument

No plate movement or transfers

Saves time and valuable resources

Reduced potential error sources



A demonstration of the ability of the QuantStudio Absolute Q dPCR System to detect mutant *KRAS* p.G12V alleles (purple dots) against a background of 99.9% wild type *KRAS* alleles (green dots) using the *KRAS* 520 assay and (orange dots) using the *KRAS* 520 assay. Green dots represent dPCR microchambers positive for both alleles.

Download at thermofisher.com/dpcrapplications

Services and support you can count on

Help maximize system uptime, reduce repair costs and turnaround time, extend the life of your instrument, and keep it running at peak performance with a comprehensive service plan.



Instrument service plans

Keep your instruments up and running

- **Professional support and maintenance:** Gain access to Thermo Fisher's knowledgeable and experienced technical support team, helping ensure your instruments are always in optimal condition
- **Remote support solutions:** Resolve issues remotely in minutes, not days, [up to 70% of the time](#), helping minimize downtime
- **Cost savings and faster recovery:** Benefit from predictable maintenance costs and get back up and running 2x faster with priority service and rapid response times



Qualification services

Keep your instruments compliant

- **Expedited qualification:** Achieve one-day qualification for most instruments
- **Comprehensive compliance documentation:** Receive complete documentation to assist in meeting laboratory and industry standards
- **Regular reviews:** Schedule regular qualification reviews to help ensure continuous compliance and verify instrument performance



Consulting services

Keep launching new molecular tests

- **Faster and cost-effective analytical validations:** Complete your analytical validations [up to 75% faster at half the cost](#) of doing them in-house
- **Proven track record:** Benefit from our experience with over 400 analytical validations completed to date
- **Global compliance support:** Enable compliance with complex and ever-changing global requirements



Educational services

Keep learning

- **Experience and credibility:** Learn from trained professionals with Thermo Fisher's trusted and high-quality education service team
- **Custom-tailored training:** Receive comprehensive and practical knowledge specifically designed to meet your unique needs and applications
- **Flexible learning environment:** Benefit from a versatile learning experience, utilizing advanced resources and technologies to fit your schedule and preferences

For the QuantStudio Absolute Q Digital PCR System, the Applied Biosystems™ AB Assurance™ service plan helps take the guesswork out of facilitating instrument uptime, from issue prevention to quick resolution. All parts, labor, and travel costs are included for standard repairs, and the annual planned maintenance makes it easy to stay on top of instrument care.

With features like SmartStart™ Orientation, you'll be set up for success. Led by professional trainers, the on-site orientation provides interactive education that includes application-specific lectures, hands-on experiment preparation, instrument and software setup, and basic data analysis.

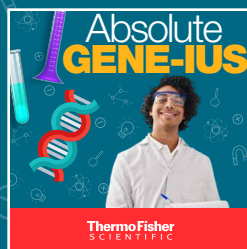
Explore our services and support solutions at thermofisher.com/instrumentservices

Absoulute GENE-IUS

Hear about it from those doing the work

Hear more examples of how dPCR is fueling innovative research across diverse applications and research areas with the **Absolute Gene-ius podcast series** that features researchers like you talking about how dPCR empowers their discovery.

Learn more at thermofisher.com/absolutegenius



Dig in, when you're ready for more

Let your appetite for more information and knowledge about dPCR be the only limiting reagents in your learning equation. Explore the exciting set of [articles](#), [application notes](#), [videos](#), and [webinars](#), for those new to dPCR and those using it daily.

Access resources at thermofisher.com/dpcreducation



Ordering information

Description	Contents	Cat. No.
QuantStudio Absolute Q Digital PCR System	See website	A52864
Absolute Q Universal DNA dPCR Master Mix (5X)	Single tube containing ready-to-use, 5X-concentrated dPCR master mix; sufficient for 200 dPCR reactions	A72710
Absolute Q 1-Step RT dPCR Master Mix (4X)	Single tube containing ready-to-use, 4X-concentrated master mix for 1-step RT-dPCR	A55146
QuantStudio Absolute Q MAP16 Plate Kit	12x 16-well microinjection-molded plates for use with the QuantStudio Absolute Q Digital PCR System	A52865

Learn more at thermofisher.com/absoluteq

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