DQ24-Dx

CE-IVD & FDA-cleared

Excellent Performance & Scalable Workflow for BCR-ABL 1 Monitoring in CML Patients

BCR-ABL1 (p210) %IS Kit (Digital PCR Method)

CE-IVD & FDA-cleared

Measuring Major and Deep Molecular Response Using Digital PCR Technology

The assay enables

High precision and accuracy

- Increased sensitivity with 1-or 2-well test per patient sample

Absolute quantification

- Eliminates the need for the standard curves required with RT-PCR

Simplified and scalable workflow

- Flexibility to process 8 to 24 samples per run
- Flexible kit design to meet your laboratory' s throughput and workflow needs

Standardized interpreted output

- Direct reporting on International Scale (%IS) and molecular response (MR) values

The best way to assess complete molecular response (CMRis with a highly sensitive molecularas say. The CE-IVD and FDA-cleared BCR-ABL1 (p210) %IS Kit (Digital PCR Method) elevates chronic myeloid leukemia (CML) monitoring to a new level of sensitivity (0.001%IS, MR 4.5 with one well), precision, and reproducibility. Sniper's BCR-ABL 1 assay delivers a scalable, reliable, and robust workflow for monitoring leukemia patients.

Instrument	Sniper DQ24-Dx
Measuring Range	MR0.3 to MR4.7
RNA Input	500 ng
Quality calibrators	3 levels of external control Positive control 1 (%IS of 10) Positive control 2 (%IS of 0.01) Negative control

"Digital PCR System is a powerful platform for monitoring patients being treated for CML. The increased sensitivity and precision of multiplexed BCR-ABL1 measurements, as compared to qPCR, along with absolute quantification in target copies and no standard curves, lends to the rationale for dPCR use in routine laboratory testing."

The Need

Reproducible Quantitative Results

Current practice guidelines from the European LeukemiaNet(ELN) and National Comprehensive Cancer Network (NCCN) for management of patients with CML call for the use of reverse transcription polymerase chain reaction assays during treatment and monitoring of patients for minimal residual disease and for identification of patients at risk of relapse (Baccarani et al. 2013, NCCN Guidelines for CML Leukemia, Version I, 2016). Globally, the clinical utility of monitoring BCR-ABL 1 mRNA has become the standard of care for managing CML patients. It is essential to minimize or eliminate the variation between and within laboratories.Therefore, reproducible molecular testing is needed to quantify BCR-ABL1.

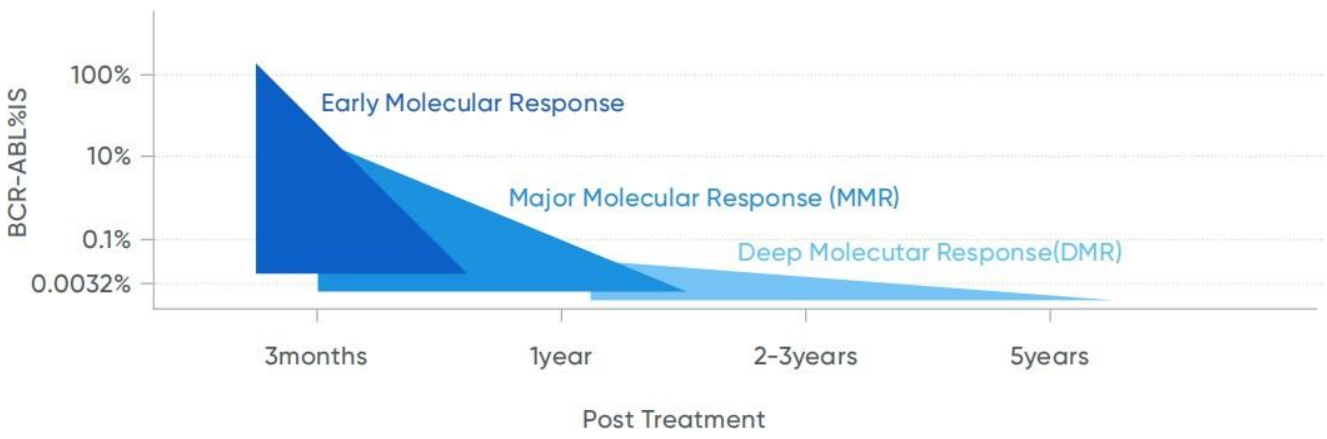
Overcoming RT-PCR Limitations

Following current practice guidelines, patients are tested every three months and results are reported in International Scale (%IS) units,which standardizes reporting of the molecular response (Branford et al.2006). However, RT-PCR has inherent limitations with regards to LOD and LOQ (Jennings et al. 2014).

Scalable Accuracy and Precision

The accuracy and precision of RT-PCR methods, especially at the lowerlimit of quantification (LOQ) and limit of detection (LOD), may also affect clinical decisions on how CML patients are monitored and therapeutically managed (Jennings et al. 2014). Effective monitoring and treatment require accurate detection at and below MR 4.7 (0.002%IS) precisely.

Time based Molecular Monitoring Milestones



The Solution

Reproducible Quantitative Results

The BCR-ABL1 (p210) %IS Kit (Digital PCR Method) is a digital PCR test that provides unparalleled reproducibility even for deep molecular responses. The digital PCR solution achieves this through absolute quantification of copies of target DNA/RNA. One PCR reaction is partitioned into 20,000 droplets. The droplets containing the target sequence are detected by fluorescence and scored as positive and those without arescored as negative. Poisson statistical analysis of positive and negative droplets yields absolute quantification of the target sequence. Unlike RT-PCR, which relies on a standard curve, sample input is the only thing contributing to minimal variability across dynamic range. The results are reported on the International Scale (IS) by using an assay - specific conversion factor determined by comparing the assay to an IS reference assay.The results are also reported as molecular response (MR) values.

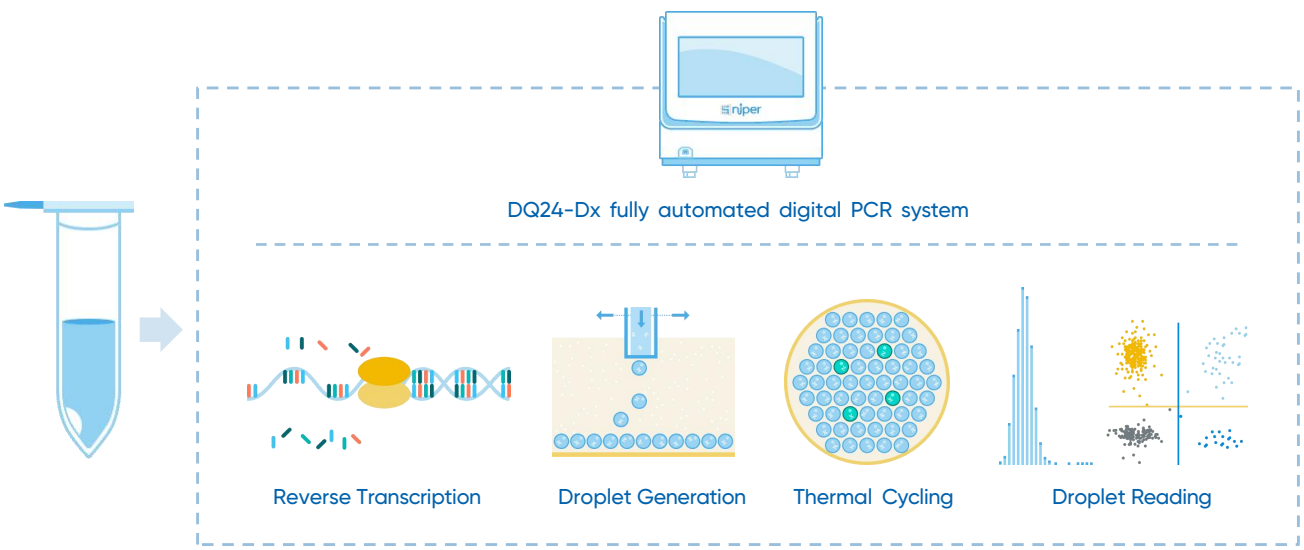
Overcoming RT-PCR Limitations

The BCR-ABL1 (p210) %IS Kit (Digital PCR Method) and dPCR technology have some inherent advantages over conventional RT-PCR. This includes scalable sensitivity with an improved LOD (1 to 2 logs) and less sensitivity to impact by amplification efficiency compared to RT-PCR. Hence, independent labs have shown that dPCR has obvious advantages over RT-PCR for monitoring disease burden (Jennings et al. 2014)

Scalable Accuracy and Precision

Digital PCR has been shown to be an accurate and highly precise method for detecting the BCR-ABL1 fusion gene (Cross et al. 2016). It is a lot more precise than traditional RT-PCR since it enables absolute quantification (Cross et al. 2016). The Digital PCR Systems are the premier clinical-ready platform enabling precise, sensitive, and scalable quantification of nucleic acids. The systems provide the flexibility to process 8 to 24 samples per run.

Simple — 2 Steps workflow



Step1

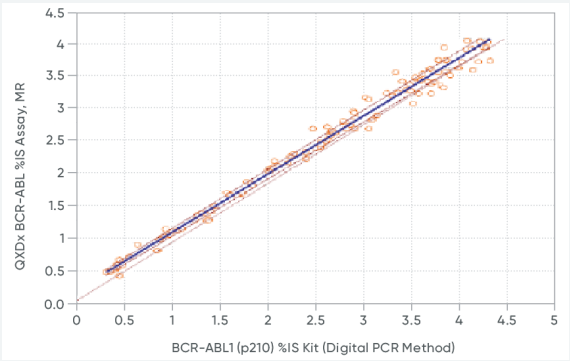
RNA Extraction

Step2

Digital PCR Testing

Passing-Bablok regression result

Correlation of the BCR-ABL1 (p210) % IS Kit (Digital PCR Method) SNF and QXDx BCR-ABL %IS Kit



The measurement results of 112 samples were analyzed by Passing-Bablok regression. y=0.17+0.99x r : 0.993

Analytical Data

The studies support an LoD of 4.7 and LoQ of 4.5 for the assay.

	1-Well Test
Limit of blank (LOB)	0
Limit of quantitation (LOQ)	0.002%IS （MR4.5）
Limit of detection (LOD)	0.002%IS (MR4.7)

Transcript	Samples	Slope	R^2 Value	2nd Order Fit Deviation
e13a2	10 （MR0.3 to MR4.7）	1.000	0.996	≤0.09MR untis
e14a2	10 （MR0.3 to MR4.7）	1.004	0.994	≤0.09MR untis

Precision —Minimal Variability across Dynamic Range of %IS and MR Value

BCR-ABL1 (p210) % IS Kit (Digital PCR Method) precision date-patient and control samples. precision:n＞100sampleswere verified as SD ≤ 0.25.

				MR Total Precision				% BCR-ABL Total Precision			
Sample ID	Type	N	Target MR	MR Mean	SD	CV%	N	Target% BCR-ABL	%IS Mean	SD	CV%
MR 1	e13a2	108	1	1.02	0.031	3.6%	108	10	9.4487	0.6892	7.30%
	e14a2	108	1	1.03	0.03	2.86%	108	10	9.3064	0.6397	6.90%
MR 3	e13a2	108	3	2.98	0.092	3.07%	108	0.1	0.1058	0.0207	19.60%
	e14a2	108	3	2.99	0.084	2.82%	108	0.1	0.1043	0.0199	19.00%
MR 4	e13a2	108	4	3.97	0.179	4.52%	108	0.01	0.0116	0.0045	39.00%
	e14a2	108	4	3.95	0.18	4.55%	108	0.01	0.0122	0.0046	38.10%
MR 4.5	e13a2	108	4.5	4.35	0.218	5.01%	108	0.0032	0.005	0.0021	42.50%
	e14a2	108	4.5	4.33	0.235	5.41%	108	0.0032	0.0052	0.0023	44.80%

Whole blood Nucleic Acid Extraction Reagent .

Related products

Product	Description	Cat. no.
BCR-ABL1 (p210) %IS Kit (Digital PCR Method)	16 tests	DT002016E
BCR-ABL1 (p210) %IS Kit (Digital PCR Method)	48 tests	DT002048E
Whole blood Nucleic Acid Extraction Reagent	48 tests	DT007048E