

RT-PCR RESEARCH SOLUTIONS

*Analyzing Complex
Rare Diseases*

A detailed 3D rendering of cancer cells, showing their irregular, spherical shapes and numerous small protrusions (microvilli) on their surfaces. The cells are colored in shades of red and pink, set against a light blue background.

Oncology

Molecular markers can be used to provide accurate prognosis and to predict response, resistance, or toxicity to therapy. Quantitative real-time PCR can determine gene duplications, deletions and can identify small mutations, down to single base changes. Real-time PCR methods are a favourable option for the analysis of cancer markers as they are easier, faster and can be multiplexed.

The assay is based on amplification of target DNA by the Polymerase Chain Reaction (PCR) and nucleic acid hybridization.

Sensitivity & Specificity

Kits with high sensitivity and specificity to detect up to 1% of mutant allele among background of 99% wild type allele.

Highly Accessible

Compatible with commonly available Real Time PCR instruments.

BCR-ABL Detection

- BCR-ABL is a chromosomal abnormality of chromosome 22, also called as the Philadelphia chromosome.
- It happens as a result of reciprocal translocation between chromosome 9 and chromosome 22 often abbreviated as t(9;22).
- The presence of BCR-ABL fusion gene is strongly associated with chronic myeloid leukemia (CML) as well as acute myeloid leukemia (AML).
- BCR-ABL1 fusion gene encodes for a tyrosine kinase enzyme which is responsible for the uncontrolled growth of leukemic cells.

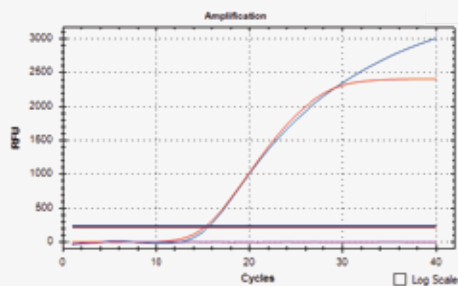


Sample Source : Peripheral blood samples & Bone marrow

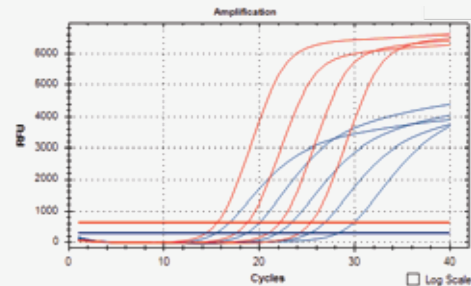
BCR-ABL Universal Real Time PCR Kit

BCR-ABL Quantitative RT PCR kit helps in the detection and differentiation of all the 3 break point cluster regions i.e. major/P210 (M-bcr), minor/P190 (m-bcr) and micro/P230 (mu-bcr), along with quantification of the major/P210 (M-bcr) transcript.

Fusion transcripts detected : Major-p210 - [e14a2 & e13a2] - qualitative & quantitative
 Minor-p190 - [e1a2]
 Micro-p230 - [e19a2]



BCR-ABL Major Real Time PCR specific amplification plot of BCR-ABL positive sample (FAM channel) along with ABL Internal Control (Texas Red channel).



BCR-ABL Real Time PCR specific amplification plot of BCR-ABL standard (FAM channel) along with Internal Control ABL standard (Texas Red channel).

BCR-ABL Quantitative Real Time PCR Kit

BCR-ABL Quantitative RT PCR kit helps in the quantitative detection of the major/P210 (M-bcr) transcript.

Fusion transcripts detected : Major-p210 - [e14a2 & e13a2]

BCR-ABL Real Time PCR Kit

BCR-ABL RT PCR kit helps in the qualitative detection and differentiation major/P210 (M-bcr), minor/P190 (m-bcr) and micro/P230 (mu-bcr) transcripts.

Fusion transcripts detected :
 Major-p210 - [e14a2 & e13a2]
 Minor-p190 - [e1a2]
 Micro-p230 - [e19a2]

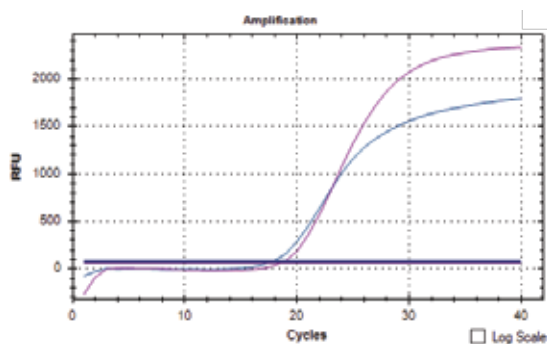
HLA B27-Q Real Time PCR Kit

- HLA (Human Leukocyte Antigens) B27 is a major histocompatibility complex (MHC) class I molecule.
- These are cell-surface glycoproteins expressed on most nucleated human cells and platelets.
- Present in 8% of normal population as it is an integral part of the immune system.
- Found in 90% of the patients with Ankylosing Spondylitis (AS) - chronic inflammatory disease of the axial musculoskeletal system.
- It is also associated with certain rheumatic disorders like Reiter's syndrome, acute anterior uveitis, and inflammatory bowel disease.
- HLA B27-Q RT PCR Kit helps in amplification of allelic region of HLA B27 gene present on chromosome 6 using specific primer & probe pairs.



Sample Source : Peripheral blood samples

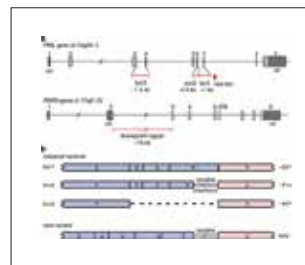
Target : B Locus in the MHC region on chromosome 6



HLA-B27-Q Real Time PCR specific amplification plot of HLA-B27 positive sample (FAM channel) along with Internal Control (Cy5 channel).

PML-RARA-Q Real Time PCR Kit

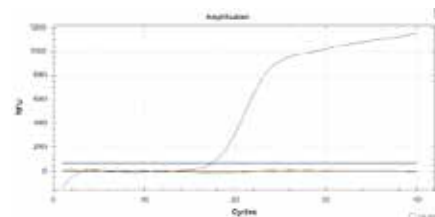
- PML-RARA fusion genes is a result of translocation between the Retinoic acid receptor alpha (RARA) gene on chromosome 17 & the Promyelocytic leukemia (PML) gene on chromosome 15 t(15;17) (q24;q21).
- It is characteristic of acute promyelocytic leukemia (APL) where it is responsible for cellular transformation.
- Depending on the breakpoint used and as a result of splicing, three different PML-RARA fusion transcripts can be generated, including the long (also known as L or bcr1 isoform), variant (V or bcr2), and short (S or bcr3) isoforms.
- PML-RARA-Q RT PCR kit helps in multiplex detection & differentiation of bcr1, bcr2 and bcr3 fusion transcripts along with Endogenous internal control.



Sample Source : Peripheral blood samples & Bone marrow.

JAK2-Q Real Time PCR Kit

- This protein is part of a signalling pathway called the JAK/STAT pathway, which transmits chemical signals from outside the cell to the cell's nucleus.
- A specific point mutation in this gene, namely, V617F, replaces the normal amino acid valine with phenylalanine, leading to uncontrolled blood cell production.
- The JAK2 V617F mutation is an acquired, somatic mutation present in the majority of patients with myeloproliferative cancer (myeloproliferative neoplasms) i.e. nearly 100% of patients with polycythemia vera and in about 50% of patients with essential thrombocytosis and primary myelofibrosis.
- JAK2-Q RT PCR Kit detects the V617F point mutation with high sensitivity and specificity.



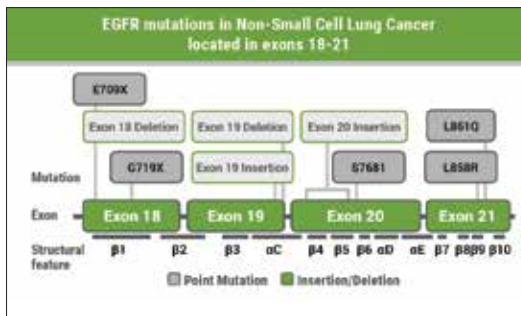
JAK2 Real Time PCR specific amplification plot of JAK2 positive sample (FAM channel) along with internal control (HEX channel).

Mutations covered : V617F point mutation.

Sample Source : Peripheral blood samples

EGFR-Q Real Time PCR Kit

- EGFR is currently the most important molecular target for the treatment of non-small cell lung cancer (NSCLC).
- Phosphorylation of EGFR can promote tumor cell growth, differentiation, invasion, metastasis, anti-apoptosis, and promote tumor angiogenesis.
- NSCLC accounts for about 80% of lung cancer patients, which is the leading cause of cancer deaths worldwide.
- EGFR-Q RT PCR kit helps in qualitative detection of common mutations across four exons 18-21 of the EGFR gene in human NSCLC samples.

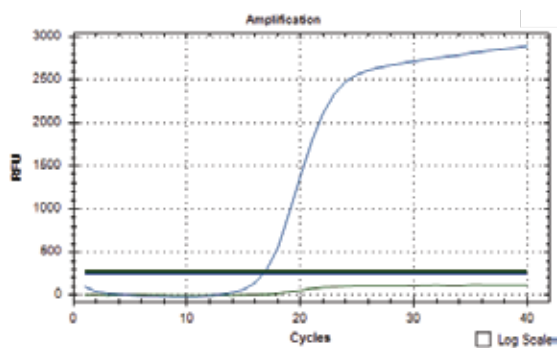


Mutations covered :

19del (19 deletions in exon 19), L858R, T790M, G719X, 3Ins20, L861Q, S768I.



Sample Source : Peripheral blood samples & FFPE tissues.



EGFR-Q Real Time PCR specific amplification plot of EGFR positive sample (FAM channel) along with internal control (HEX channel).

BRCA-Q Real Time PCR Kit

- BRCA1 and BRCA2 genes are the two most common Tumor Suppressor genes.
- Mutations in these genes can lead to an increased risk of developing breast, ovarian, and prostate cancer.
- BRCA-Q Real Time PCR Kit is a qualitative in vitro test for the detection of BRCA1 & BRCA2 gene mutations in clinical samples.
- Helps in detection and allelic differentiation of six somatic mutations - five mutations of BRCA1 gene and one mutation of BRCA2 gene.

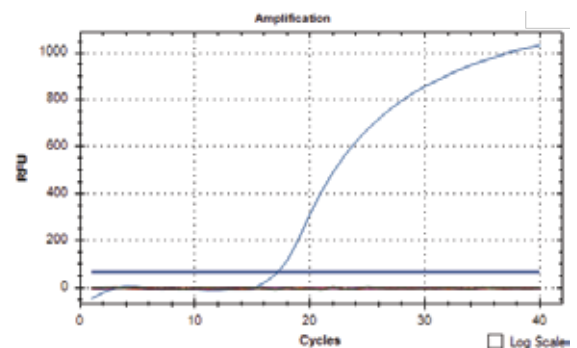


Mutations covered :

BRCA1 gene mutations 185delAG, 300T>G, 4153delA, 5382insC, 2080delA.



Sample Source : Peripheral blood samples



BRCA Real Time PCR specific amplification plot of BRCA positive sample (FAM channel) along with internal control (Cy5 channel).

EML4-ALK Real Time PCR Kit

Including ROS1 Mutations

- Gene rearrangements between EML4 (gene and echinoderm microtubule-associated protein-like 4) and ALK (anaplastic lymphoma kinase) genes result in EML4-ALK fusion genes.
- These are located on the P21 and P23 bands on chromosome 2 in humans.
- These are characteristic of 5% NSCLC and 3-13% of lung tumors.
- 20 different fusion variants are present- where mutant 1 (E13; A20) is the most common one, followed by mutants 3a and 3b (E6; A20).
- EML4-ALK RT PCR kit detects 12 common fusion mutations of EML4-ALK & 14 types of ROS1 fusion gene mutations in human known-small cell lung cancer samples.

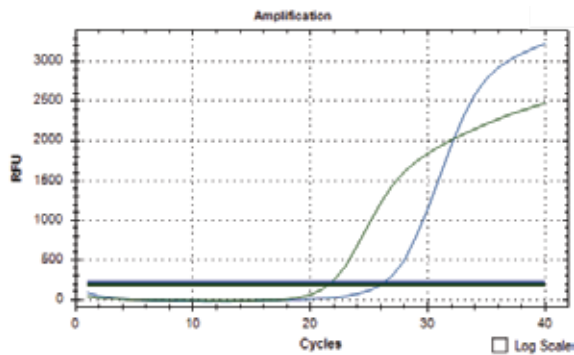


Mutations covered :

Variant 1, Variant 2, Variant 3a, Variant 3b, Variant 4, Variant 5a, Variant 5b, Variant 5', Variant 6, Variant 7, Variant 8a, Variant 8b.



Sample Source : Peripheral blood samples



EML4-ALK Real Time PCR specific amplification plot of EML4-ALK positive sample (FAM channel) along with internal control (Cy5 channel).

KRAS-Q Real Time PCR kit

- KRAS gene, instructs production of K-Ras protein, a part of the RAS/MAPK pathway.
- Mutations in K-ras result in continuous malignant proliferation of cells and resistance to EGFR tyrosine kinase inhibitors in lung cancer patients and resistance to anti-EGFR antibody drugs in colorectal cancer patients.
- Mutations in KRAS gene have been found in some types of cancer, including non-small cell lung cancer (15%-30%), colorectal cancer (20%-50%), and pancreatic cancer.
- KRAS-Q Real Time PCR kit is intended for detection of 8 mutations in codons 12 and 13 of exon 2.

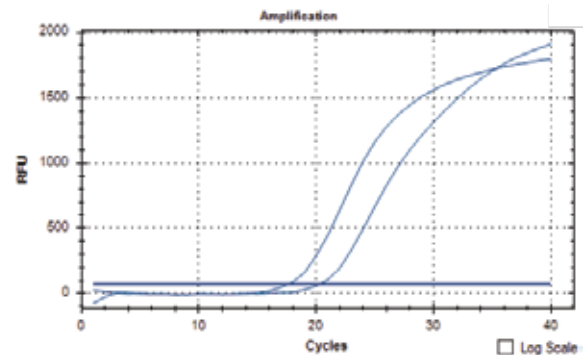


Mutations covered :

Exon 12, Gly12Ala, Gly12Asp, Gly12Arg, Gly12Cys, Gly12Ser, Gly12Val, Exon 13, Gly13Asp, Gly13Cys.



Sample Source : FFPE tissues.



KRAS-Q Real Time PCR specific amplification plot of KRAS positive sample (FAM channel) along with internal control (Cy5 channel).

FLT3-Q Real Time PCR kit

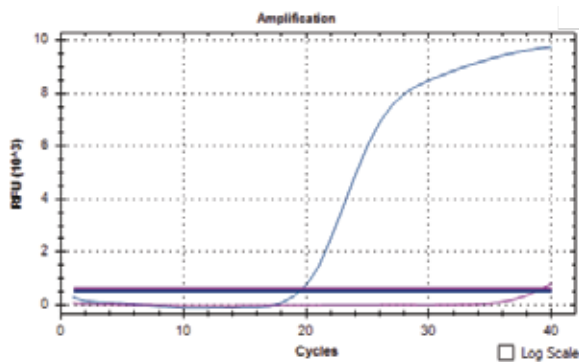
- The FMS-like tyrosine gene (FLT3) codes for a transmembrane receptor/ signalling protein (FLT3) of the tyrosine kinase group.
- It is involved in cell growth and inhibition of apoptosis.
- Variants of FLT3 have been found in some hematopoietic neoplasms and are particularly common in adult acute myeloid leukemia (AML) (20% to 30% incidence rate).
- FLT3-Q Real-Time PCR Kit is based on real-time PCR in combination with gel-based technology, for the Qualitative detection of internal tandem duplications (ITD) and tyrosine kinase domain (TKD) mutation.



Mutations covered :
 nternal tandem duplications (ITD).
 D835Y mutation in the Tyrosine kinase domain (TKD).



Sample Source : Peripheral blood samples



FLT3 Real Time PCR specific amplification plot of FLT3 positive sample (FAM channel) along with internal control (HEX channel).

BRAF-Q Real Time PCR kit

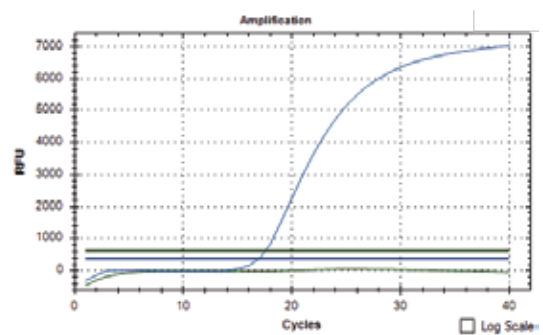
- The protein encoded by the BRAF gene is a serine/threonine specific protein kinase that exists in the cytoplasm.
- It is an important signal regulator in the RAS/RAF/MEK/ERK/MAPK pathway, and is involved in the regulation of various biological activities in cells, such as cell growth, differentiation and apoptosis.
- BRAF mutations are commonly found in malignant tumours such as melanoma, colorectal cancer, thyroid cancer, and lung cancer.
- BRAF-Q Real Time PCR kit is intended for detection of BRAF gene V600E mutation on exon 15- the most common one.



Mutations covered : V600E mutation.



Sample Source : FFPE tissues.



BRAF Real Time PCR specific amplification plot of BRAF positive sample (FAM channel) along with internal control (HEX channel).

AML1 Fusion Real Time PCR kit

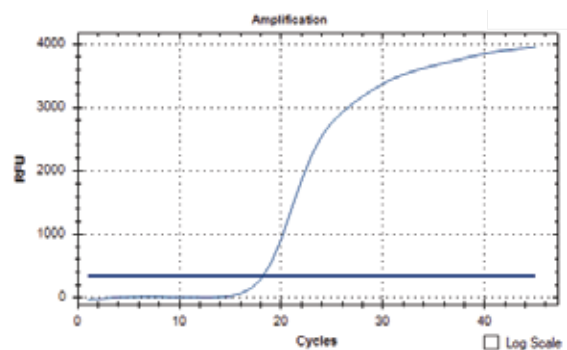
- The leukemic fusion protein AML1-ETO occurs frequently in human acute myeloid leukemia (AML).
- AML1 fusion Real Time PCR Kit is an in vitro diagnostic test for the qualitative detection of fusion of AML1 & ETO genes in clinical samples.
- In vitro detection of AML1-ETO fusion gene transcripts [AML1 exon 5 is fused to ETO exon 2].



Mutations covered : AML1-ETO.



Sample Source : Peripheral blood samples



Amplification plot of AML 1 fusion positive control

PIK3CA Real Time PCR Kit

- PIK3CA gene encodes the p110 α catalytic subunit of phosphatidylinositol-3-kinase and is essential for important physiological functions such as regulating cell proliferation, survival, death, and differentiation.
- Mutations in the PIK3CA gene are known to directly or indirectly affect the medication and prognosis of colorectal, breast, lung, cervical cancers, etc. and hence accurate diagnosis is critical.
- The mutation rates are 26% for breast cancer, 25% for colorectal cancer, and 2% for lung cancer, with mutation sites concentrated in exon 9 and 20.
- The five most common mutations were E542K, E545K, E545D and H1047R/L, among which E542K accounted for 5.7%, E545K 8.5%, E545D 0.2% and H1047R/L 18.8%.
- PIK3CA-Q RT PCR Kit helps in the qualitative detection of the common PIK3CA gene mutations in human clinical samples.



Mutations covered : E542K, E545K, E545D, H1047R, H1047L



Sample Source : Fresh tissue, formalin fixed paraffin-embedded (FFPE)

NRAS Real Time PCR kit

- NRAS belongs to the Ras family of oncogenes which encodes for N-ras protein, primarily involved in regulating cell growth and differentiation.
- It is a GTPase protein which are central mediators downstream of growth factor receptor signaling and function by relaying signals from outside the cell to the cell's nucleus.
- NRAS is altered in 3.03% of all cancers with cutaneous melanoma, melanoma, colon adenocarcinoma, acute myeloid leukemia, and lung adenocarcinoma having the greatest prevalence of alterations.
- The most common mutations in the NRAS gene are found in codons 12, 13 and 61 leading to uncontrolled proliferation and cancerous transformation of normal cells.
- NRAS RT-PCR is a quantitative test for the detection of 8 different mutations in the NRAS gene which are implicated in the pathogenesis of several cancers.



Mutations covered : Codon 12, 13 and 61: G12D, G13R, G13D, G13V, A59D, Q61R, K117N, A146T



Sample Source : Fresh, frozen or formalin fixed paraffin-embedded (FFPE) tissues

Ordering Information

Commercial Name	Cat No.	Pack Size	Compatible Instruments
BCR-ABL Universal Real Time PCR Kit	G2M802721	50 T	Instruments with FAM, ROX, Cy5, HEX/VIC Channels including RAPICycler - 96, ABI Prism®7500 & Quantstudio, BioRad CFX96, Roche Lightcycler, Qiagen Rotor-Gene, etc.
BCR-ABL Quantitative Real Time PCR Kit	G2M802821	50 T	
BCR-ABL Real Time PCR Kit	G2M708921	50 T	
HLA B27-Q Real Time PCR Kit	G2M801121	50 T	
PML-RARA Real Time PCR Kit	G2M708821	50 T	
Jak2-Q Real Time PCR Kit	G2M802621	50 T	
EGFR-Q Real Time PCR Kit	G2M708121	25 T	
BRCA-Q Real Time PCR Kit	G2M802521	50 T	
EML4-ALK Real Time PCR Kit	G2M708321	50 T	
KRAS-Q Real Time PCR Kit	G2M708421	25 T	
FLT3-Q Real Time PCR Kit	G2M709021	50 T	
AML1 Fusion Real Time PCR Kit	G2M802921	50 T	
BRAF-Q Real Time PCR Kit	G2M708521	25 T	
PIK3CA-Q Real-Time PCR Kit	G2M708221	25 T	
NRAS Real-Time PCR Kit	G2M708621	25 T	