ARUP LABORATORIES
800-522-2787 | aruplab.com
500 Chipeta Way, Salt Lake City, UT 84108-1221
Jonathan R. Genzen, MD, PhD, Chief Medical Officer

Client: Example Client ABC123
123 Test Drive
Salt Lake City, UT 84108
UNITED STATES

Physician: Doctor, Example

Patient: Patient, Example

DOB	11/16/1961
Gender:	Male
Patient Identifiers:	01234567890ABCD, 012345
Visit Number (FIN):	01234567890ABCD
Collection Date:	00/00/0000 00:00

Diagnostic Qualitative BCR-ABL1 Assay with Reflex to p190 or p210 Quantitative Assays

ARUP test code 3005839

Diagnostic Qual BCR-ABL1 Assay, Source	Whole Blood
Diagnostic Qual BCR-ABL1 Assay, Result	**Positive Major** *

There is evidence of major (p210, e13a2, or e14a2) BCR-ABL1 fusion transcripts by RT-PCR analysis.

BCR-ABL1 quantitative testing will be performed. Additional charges will apply.

This result has been reviewed and approved by [redacted]

H=High, L=Low, *=Abnormal, C=Critical

INTERPRETIVE INFORMATION: Diagnostic Qualitative BCR-ABL1
Assay with Reflex to p190 or p210
Quantitative Assays

This assay is designed to detect the presence of BCR-ABL1 translocations with breakpoints in the major breakpoint cluster region (p210 fusion), minor breakpoint cluster region (p190 fusion), or the micro breakpoint cluster region (p230 fusion) for screening purpose at the time of an initial diagnosis.

METHODOLOGY:
RNA is isolated from whole blood or bone marrow and reverse transcribed. The resulting cDNA is subjected to multiplex PCR amplification with primers designed to amplify p190, p210, or p230 BCR-ABL1 fusion transcripts involving ABL1 exon 2. The ABL1 reference gene is also amplified for specimen quality control and to ensure the integrity of RNA. The PCR products are resolved by capillary electrophoresis and evaluated for the presence of amplicons that indicate a positive result. A positive common p210 or p190 result will trigger either quantitative p210 or p190 testing to provide a quantitative level as the diagnostic baseline to monitor treatment response. The p210 transcript level is reported as the percent International Scale (%IS). The p190 transcript level is reported as the normalized copy numbers (NCN). These quantitative results are integrated into the final report. If the initial qualitative testing is negative, or a rare p230 from is detected, then no reflex testing will be performed.

ANALYTICAL SENSITIVITY:

Fusion Transcripts	Analytical Sensitivity
Minor (e1a2)	NCN = 0.00004
Major (e13a2)	%IS = 0.0040
Major (e14a2)	%IS = 0.0047
Micro (e19a2)	1 x 10-5 RNA molecules

CLINICAL SENSITIVITY:
Estimated to be greater than 99 percent for chronic myelogenous leukemia (CML).

LIMITATIONS:
Rare BCR-ABL1 fusions with alternative breakpoints (e.g., any fusion transcripts involving ABL1 other than exon 2) are not detected by this test. This qualitative test is designed as a screening test for initial diagnosis of chronic myeloid leukemia (CML) or acute lymphoblastic leukemia/lymphoma (ALL). This test is not intended to monitor therapeutic response or to detect minimal residual disease (MRD). Low-level fusion transcripts indicating MRD might not be detected by inappropriate use of this test. Results of this test must always be interpreted within the clinical context and other relevant data and should not be used alone for a diagnosis of malignancy.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. This test was performed in a CLIA-certified laboratory and is intended for clinical purposes.

Quantitative Detection of BCR-ABL1, Major Form (p210)

ARUP test code 3005840

Quant BCR-ABL1, Major (p210), Source	Whole Blood	
Quant BCR-ABL1, Major (p210), Result	**Detected**	*

H=High, L=Low, *=Abnormal, C=Critical

BCR-ABL1 fusion transcripts (p210 forms) were detected by RT-qPCR.

This result has been reviewed and approved by

INTERPRETIVE INFORMATION: Quantitative Detection of BCR-ABL1, Major Form(p210)

This assay quantifies BCR-ABL1 transcripts (e13a2 and e14a2) for ongoing therapeutic monitoring and minimal residual disease detection. BCR-ABL1 translocations with BCR breakpoints in the major breakpoint cluster region result in the p210 fusion protein and are seen in nearly all cases of chronic myelogenous leukemia (CML) and in a few cases of acute lymphoblastic leukemia/lymphoma (ALL). To facilitate the interlaboratory comparison of findings and the assessment of molecular milestones (major molecular response or MMR), results are reported using the international scale (IS; see Muller MC, et al. Leukemia. 2009;23:1957-1963).

METHODOLOGY:
Total RNA was isolated and converted to cDNA; BCR-ABL1 fusions were quantitated by real-time PCR amplification with primers designed to detect the major (p210) BCR-ABL1 breakpoint, including fusions between BCR exon 13 and ABL1 exon 2 (e13a2) and BCR exon 14 and ABL1 exon 2 (e14a2). Each PCR assay includes a standard curve for BCR-ABL1 and the ABL1 control.

The normalized copy number(NCN)is calculated and converted to a value on the international scale (IS) using a validated reference sample (provided by Qiagen, Germantown, MD; see White HE, et al. Blood. 2010;116:111-117) that was calibrated to a standard set of diagnostic specimens defined during the original trial of tyrosine kinase inhibitor therapy in CML patients (Hughes TP, et al. NEJM. 2003;349:1423-1432).

ANALYTICAL SENSITIVITY:
Detection limit percent international scale (IS) at 0.0032.

LIMITATIONS:
The limit of quantification is 0.0032 percent IS. This assay does not detect transcripts resulting from a rare BCR-ABL1 rearrangement with a BCR exon 19 breakpoint that results in the p230 fusion protein,and does not detect the minor breakpoint (p190) or rare major fusion transcripts (p210) involving ABL1 other than exon 2. The results of this test must be interpreted in the context of morphologic and other relevant data, and should not be used alone for a diagnosis of malignancy.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. This test was performed in a CLIA-certified laboratory and is intended for clinical purposes.

Quant BCR-ABL1, Major (p210), IS Percent	10.0000 %
Quant BCR-ABL1, Major (p210), EER	See Note Authorized individuals can access the ARUP Enhanced Report using the following link:

H=High, L=Low, *=Abnormal, C=Critical

VERIFIED/REPORTED DATES

Procedure	Accession	Collected	Received	Verified/Reported
Diagnostic Qual BCR-ABL1 Assay, Source	22-321-100880	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Diagnostic Qual BCR-ABL1 Assay, Result	22-321-100880	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Quant BCR-ABL1, Major (p210), Source	22-321-100880	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Quant BCR-ABL1, Major (p210), Result	22-321-100880	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Quant BCR-ABL1, Major (p210), IS Percent	22-321-100880	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Quant BCR-ABL1, Major (p210), EER	22-321-100880	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00

END OF CHART

H=High, L=Low, *=Abnormal, C=Critical