CHRONIC MYELOGENOUS LEUKEMIA, BY PCR

London Health Sciences Centre | St. Joseph's Health Care London

Pathology and Laboratory Medicine

Orderable – E-order/Requisition

Turnaround Time: 10 days

Laboratory:
Molecular Diagnostics Lab

Requisition:
MOLECULAR DIAGNOSTIC REQUISITION

Method of Analysis:
Q-RT-PCR Light Cycler

Test Schedule:
As required,
Monday to Friday 0800-1600 hours

Alternate Name(s):

CML
BCR/ABL
Philadelphia Chromosome

Specimen:

Bone marrow
or
2 x 4 mL K_2 or K_3 EDTA Lavender top Vacutainer tube

Collection Information:

Blood samples must be maintained at room temperature.

Reference Ranges:

See report

Interpretive Comments:

Chronic myelogenous leukemia is invariably associated with a cytogenetic abnormality involving a reciprocal translocation of chromosomes 9 and 22, in which the downstream portion of the *abl* proto oncogene on chromosome 9 is brought into close proximity to the upstream portion of the *bcr* gene on chromosome 22. It is possible to detect this translocation using molecular techniques, and in addition to quantify the amount of aberrant Philadelphia Chromosome copy number [1]. RNA was extracted from peripheral blood, reverse transcribed into cDNA and amplified by PCR using primers specific for the BCR gene on chr. 22 and the ABL gene on chr. 9. BCR-ABL fusion transcripts were detected by Q-RT-PCR in a Roche light cycler. The level of fusion gene transcript in the test sample is expressed as a **log reduction**; i.e. $\log_{10}$ of the ratio of chimeric BCR-ABL/normal ABL mRNA transcript seen in a panel of individuals with untreated CML as compared to the ratio seen in the patient. The value of the ratio in untreated CML (5.0)has been adjusted to obtain $\log_{10}$ reduction

values for a series of shared samples (GLEEM 3 Trial) in line with a dozen other molecular diagnostic laboratories across Canada. **A log reduction of 4 represents a 2,000-fold reduction of chimeric BCR-ABL transcript from the average value seen in untreated CML** and this assay method approaches its limit of sensitivity at a log reduction of 5.

Reference

1. *Hughes TP et al N.E.J.M. (2003) 349: 1423-1432*

Comments:

Retesting of samples received less than 3 months after initial testing need to be approved by the Laboratory Director.

Critical Information Required:

Leukocyte count must be provided as well as Clinical status of patient, i.e. phase of disease and treatment in progress (Gleevac, Bone marrow transplant etc.)

Storage and Shipment:

Must be received in testing laboratory within 48 hours of collection, shipped at room temperature by courier/overnight delivery.