A 4.5-log reduction of BCR-ABL1 transcript levels (MR4.5 or 0.0032% on the International Scale) is associated with deep molecular response and potential treatment-free response of Ph+ CML.

This level of analytical sensitivity requires a sufficient quantity and concentration of BCR-ABL1 in the test reaction for reverse transcription and quantification PCR analysis (RT-qPCR). Standard protocols for isolating RNA from whole blood, however, may yield RNA that is too dilute to achieve such analytical sensitivity.

The purpose of this study was to increase RNA yield and concentration from commercially available RNA isolation kits as a model approach for use in routine CML monitoring.

Modifications to commercially available isolation kits improved RNA yield and concentration and were easily implemented to achieve reliable and consistent RNA concentration at ≥100 ng/µL.

Introduction

Although qPCR-based techniques can meet the sensitivity requirements to properly monitor CML patients at <100, there are few analytical test positions that would be considered to meet the requirements to monitor for minimal residual disease (MRD). Ph+ CML patients are monitored using qPCR, which requires isolation of RNA from whole blood in large quantities to detect low levels of BCR-ABL1 (≥100 ng/µL). RNA must be purified to a concentration of ≥100 ng/µL to meet the analytical sensitivity needed to detect low levels of BCR-ABL1. Due to the nature of CML, the patient's RNA sample is typically collected for RNA extraction and put into the qPCR assay, expected sensitivity may not be achievable due to dilution.