The development of advanced molecular platforms, bioinformatics tools and the rapidly growing number of biomarkers that are the potential targets for new therapies have contributed to a rapid increase in cancer testing. Acute myeloid leukemia (AML), myelodysplastic syndrome (MDS), and myeloproliferative neoplasms (MPN) are clonal disorders of hematopoietic stem cells. The simultaneous detection of somatic mutations in multiple candidate target genes as markers of the neoplastic clone by the NGS IntelliGEN® Myeloid panel can provide information in diagnosis, prognostic risk stratification and eligibility for targeted therapy. In this study, the clinical and analytical performance features of this assay are evaluated.

Methods

The IntelliGEN® Myeloid panel utilizes amplicon-based next generation sequencing to identify alterations: single nucleotide variants (SNVs) and insertion/deletions (InDels) in 50 genes and whole-gene copy number alterations (CNAs) in 13 genes. DNA from blood, bone marrow and cell pellet were used to evaluate the assay’s accuracy, repeatability, reproducibility and analytical sensitivity. Identified reportable mutations were confirmed by a secondary method.

Results

Of the 60 specimens tested during validation, 97 variants identified were confirmed by a secondary method and showed 92.8% concordance. Discordances were most likely due to low detection sensitivity of the confirmation method. Repeatability (intra-assay precision) and reproducibility (inter-assay precision) were 100% for SNVs and InDels, and 89% for CNAs. The sensitivity of this assay is 5-10% variant allele fraction for SNVs and InDels. This assay can detect whole-gene CNAs of 25% or greater when the input DNA is 200 ng or more.

Conclusions

The IntelliGEN® Myeloid panel is a robust and reproducible assay using blood, bone marrow and cell pellet. The molecular alterations provided by this assay can assist in diagnosis, prognosis and making cancer treatment decisions involving targeted therapies.

References

1. Archer™ VariantPlex™ Solid Tumor Kit for Illumina Protocol. PR-SK0051-ILMN. Rev A.