

# GenOnc Myeloid Neoplasms Cancer Panel

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### Introduction

GenOnc Myeloid Neoplasms Panel is a collection of multiplexed PCR primer assays for targeted enrichment of the coding (exonic) regions of the 50 genes most commonly mutated in human myeloid leukemia samples. Mutations in these oncogenes and tumor suppressor genes are often relevant for cancer classification, and warrant extensive investigation to enhance the understanding of carcinogenesis. The term myeloid leukemia covers a spectrum of diseases called hematological neoplasms, but mostly refers to cancer of the blood or bone marrow characterized by an abnormal increase in immature myeloid white blood cells. Common initiating events for leukemia carcinogenesis are upregulation of survival genes and dysregulation of cell growth. Genes commonly mutated during these events include the receptor tyrosine kinases FLT3 or KIT for acute myeloid leukemia, and TP53 or RB1 for chronic myeloid leukemia. Each of these genes can acquire a variety of different mutations, and each myeloid neoplasm itself can acquire mutations in multiple genes. Therefore, a panel of key genes commonly mutated in myeloid leukemia is an efficient way to research a tumor sample's potential carcinogenic mechanisms. This panel narrows the focus to the most relevant mutated genes in myeloid leukemia, using a variety of resources such as recent whole genome/exome sequencing studies from scientific networks including the Cancer Genome Atlas. Curated databases such as the Cancer Gene Census and COSMIC (Catalogue of Somatic Mutations in Cancer) are also used.

## GenOnc Myeloid Neoplasms Panel Genes

### Acute Myeloid Leukemia (AML):

ASXL1, BCOR, BCORL1, CEBPA, DAXX, FLT3, GATA1, IDH1, IDH2, IKZF1, JAK1, JAK3, KIT (CD117), KRAS, MLL, MPL, NPM1, NRAS, PHF6, PTPN11, RAD21, RUNX1 (AML1), SF1, SF3A1, SMC1A (SMC1L1), SMC3, STAG2, U2AF1, U2AF2, WT1

### Chronic Myeloid Leukemia (CML):

ABL1, RB1, SMC1A (SMC1L1), TP53

### Myelodysplastic Syndromes (MDS):

ATRX, GNAS, MLL, RAD21, RB1, SETBP1, SF1, SF3A1, SMC3, STAG2, U2AF1, U2AF2, ZRSR2

### Myeloid Malignancies:

CBL, CBLB, DNMT3A, EED, ETV6, EZH2, PRPF40B, SUZ12, TET2, TP53

### Myeloproliferative Neoplasm (MPN):

ABL1, ASXL1, JAK2, JAK3, KAT6A (MYST3), KRAS, MPL, NF1, NRAS, RB1, SETBP1, SF3B1, SH2B3, SRSF2, STAG2

### Myelofibrosis (MF):

IDH1, IDH2