

Overview

Useful For

Comprehensive reanalysis of a larger set of genes/gene regions when a more targeted gene panel was previously performed in this laboratory

Evaluation of known or suspected hematologic neoplasms, specifically of myeloid origin (eg, acute myeloid leukemia, myelodysplastic syndrome, myeloproliferative neoplasm, myelodysplastic/myeloproliferative neoplasm, unexplained cytopenias) at the time of diagnosis or possibly disease relapse, to help determine diagnostic classification and provide prognostic or therapeutic information for helping guide clinical management

Determine the presence of new clinically important gene mutation changes at relapse

Genetics Test Information

This test includes next-generation sequencing to evaluate the following 47 genes and select intronic regions: *ANKRD26*, *ASXL1*, *BCOR*, *BCORL1*, *BRAF*, *CALR*, *CBL*, *CEBPA*, *CSF3R*, *DDX41*, *DNMT3A*, *ELANE*, *ETNK1*, *ETV6*, *EZH2*, *FLT3*, *GATA1*, *GATA2*, *IDH1*, *IDH2*, *JAK2*, *KDM6A*, *KIT*, *KRAS*, *MPL*, *NF1*, *NPM1*, *NRAS*, *PHF6*, *PPM1D*, *PTPN11*, *RAD21*, *RUNX1*, *SETBP1*, *SH2B3*, *SF3B1*, *SMC3*, *SRSF2*, *STAG2*, *STAT3*, *TERT*, *TET2*, *TP53*, *U2AF1*, *UBA1*, *WT1*, and *ZRSR2*.

Testing Algorithm

Only orderable as a reflex. Reflex testing is available upon request within 6 months of original NGAMT / Acute Myeloid Leukemia, Therapeutic Gene Mutation Panel (*FLT3*, *IDH1*, *IDH2*, *TP53*), Next Generation Sequencing, Varies or NGAML / Acute Myeloid Leukemia, 11-Gene Panel, Varies sample submission.

This is a bioinformatics and variant review only for the added gene regions.

For a list of genes and exons targeted by this test see [Targeted Genes Interrogated by Myeloid Neoplasms, Comprehensive OncoHeme Next-Generation Sequencing](#).

Special Instructions

- [Hematopathology Patient Information](#)
- [Targeted Genes Interrogated by Myeloid Neoplasms, Comprehensive OncoHeme Next-Generation Sequencing](#)

Method Name

Only orderable as a reflex. For more information, see:

-NGAMT / Acute Myeloid Leukemia, Therapeutic Gene Mutation Panel (*FLT3*, *IDH1*, *IDH2*, *TP53*) Next-Generation Sequencing, Varies

-NGAML / Acute Myeloid Leukemia, 11-Gene Panel, Varies.

Next-Generation Sequencing (NGS)

NY State Available

Yes

Specimen

Specimen Type

Varies

Specimen Required

No additional specimen is required. This is a bioinformatics review of additional gene regions not analyzed in the previously ordered NGAMT / Acute Myeloid Leukemia, Therapeutic Gene Mutation Panel (*FLT3*, *IDH1*, *IDH2*, *TP53*), Next-Generation Sequencing or NGAML / Acute Myeloid Leukemia, 11-Gene Panel. Call 800-533-1710 for assistance with ordering.

Forms

1. [Hematopathology Patient Information](#) (T676)
2. If not ordering electronically, complete, print, and send an [Hematopathology/Cytogenetics Test Request](#) (T726) with the specimen.

Reject Due To

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies	14 days	

Clinical & Interpretive

Clinical Information

Next-generation sequencing is a comprehensive molecular diagnostic methodology that can interrogate multiple regions of genomic tumor DNA in a single assay. Many hematologic neoplasms are characterized by morphologic or phenotypic similarities but can have characteristic somatic mutations in many genes that enable more specific categorization. In addition, many myeloid neoplasms lack a clonal cytogenetic finding at diagnosis (normal karyotype) but can be diagnosed or confirmed and classified according to the gene mutation profile. Patients with unexplained cytopenias may harbor acquired genetic alterations in hematopoietic cells (clonal cytopenias of uncertain significance), which may carry the risk of developing overt myeloid malignancies. The presence and pattern of gene mutations in known or suspected myeloid neoplasm can provide critical diagnostic, prognostic, and therapeutic information to help guide management for the patient's physician.

Reference Values

Only orderable as a reflex. For more information, see:

-NGAMT / Acute Myeloid Leukemia, Therapeutic Gene Mutation Panel (*FLT3*, *IDH1*, *IDH2*, *TP53*), Next-Generation Sequencing, Varies

-NGAML / Acute Myeloid Leukemia, 11-Gene Panel, Varies.

Interpretation

Detailed variant assessment and interpretive comments will be provided for all reportable genetic alterations.

If this test is ordered in the setting of erythrocytosis and suspicion of polycythemia vera, interpretation requires correlation with a concurrent or recent prior bone marrow evaluation.

Cautions

This test is a targeted next-generation sequencing (NGS) assay that encompasses 47 genes with variable full exon, partial region (including select intronic or non-coding regions), or hot spot coverage (depending on specific locus). Therefore, this test will not detect other genetic abnormalities in genes or regions outside the specified target areas. The test detects single base substitutions (ie, point mutations) as well as small insertion or deletion type events, but it does not detect gene rearrangements (i.e., translocations), gene fusions, copy number alterations, or large scale (segmental chromosome region) deletions and complex changes.

This assay does not distinguish between somatic and germline alterations in analyzed gene regions, particularly with variant allele frequencies near 50% or 100%. If nucleotide alterations in genes associated with germline variant syndromes are present and there is a strong clinical suspicion or family history of malignant disease predisposition, additional genetic testing and appropriate counseling may be indicated. A low incidence of gene mutations associated with myeloid neoplasms can be detected in nonmalignant hematopoietic cells in individuals with advancing age (clonal hematopoiesis of indeterminate potential), and these may not be clearly distinguishable from tumor-associated mutations. Some apparent mutations classified as variants of uncertain significance may represent rare or low-frequency polymorphisms.

Prior treatment for hematologic malignancy could affect the results obtained in this assay. In particular, a prior allogeneic hematopoietic stem cell transplant may cause difficulties in resolving somatic or polymorphic alterations or assigning variant calls correctly to donor and recipient fractions if pertinent clinical or laboratory information (eg, chimerism engraftment status) is not provided.

The finding of a genetic alteration does not necessarily indicate the presence of a myeloid neoplasm. Correlation with clinical, histopathologic, and additional laboratory findings is required for final interpretation of NGS results and is the responsibility of the managing physician.

Clinical Reference

1. National Comprehensive Cancer Network (NCCN): NCCN Guidelines: Acute Myeloid Leukemia. NCCN; Version 2.2022 Available at www.nccn.org/guidelines/guidelines-detail?category=1&id=1411
2. National Comprehensive Cancer Network (NCCN): NCCN Guidelines: Myeloproliferative Neoplasms. NCCN; Version 2.2022. Available at www.nccn.org/guidelines/guidelines-detail?category=1&id=1477
3. National Comprehensive Cancer Network (NCCN): NCCN Guidelines: Myelodysplastic Syndromes. NCCN; Version 3.2022. Available at www.nccn.org/guidelines/guidelines-detail?category=1&id=1446
4. He R, Chiou J, et al: Molecular markers demonstrate diagnostic and prognostic value in the evaluation of myelodysplastic syndromes in cytopenia patients. *Blood Cancer J.* 2022 Jan 25;12(1):12. doi:

10.1038/s41408-022-00612-w

5. Malcovati L, Galli A, et al: Clinical significance of somatic mutation in unexplained blood cytopenia. *Blood*. 2017 Jun 22;129(25):3371-3378. doi: 10.1182/blood-2017-01-763425
6. DiNardo CD, Stein EM, et al: Durable remissions with ivosidenib in IDH1-mutated relapsed or refractory AML. *N Engl J Med*. 2018 Jun 21;378(25):2386-2398. doi: 10.1056/NEJMoa1716984
7. Stein EM, DiNardo CD, et al: Molecular remission and response patterns in patients with mutant-IDH2 acute myeloid leukemia treated with enasidenib. *Blood*. 2019 Feb 14;133(7):676-687. doi: 10.1182/blood-2018-08-869008
8. Döhner H, Estey E, et al: Diagnosis and management of AML in adults: 2017 ELN recommendations from an international expert panel. *Blood*. 2017 Jan 26;129(4):424-447. doi: 10.1182/blood-2016-08-733196
9. Smith CC: The growing landscape of FLT3 inhibition in AML. *Hematology Am Soc Hematol Educ Program*. 2019 Dec 6;2019(1):539-547. doi: 10.1182/hematology.2019000058
10. Kennedy JA, Ebert BL: Clinical implications of genetic mutations in myelodysplastic syndrome. *J Clin Oncol*. 2017 Mar 20;35(9):968-974. doi: 10.1200/JCO.2016.71.0806
11. Daver N, Schlenk RF, Russell NH, Levis MJ: Targeting FLT3 mutations in AML: review of current knowledge and evidence. *Leukemia*. 2019 Feb;33(2):299-312. doi: 10.1038/s41375-018-0357-9
12. Swerdlow SH, Campo E, Harris NL, et al: WHO classification of tumours of hematopoietic and lymphoid tissues. IARC Press; 2017

Performance

Method Description

This analysis requires either NGAMT / Acute Myeloid Leukemia, Therapeutic Gene Mutation Panel (*FLT3*, *IDH1*, *IDH2*, *TP53*), Next-Generation Sequencing Varies or NGAML / Acute Myeloid Leukemia, 11-Gene Panel, Varies to have been previously performed at Mayo Clinic Laboratories within the last 6 months. An extended bioinformatics analysis is performed on the original data by a bioinformatics pipeline, and a variant call file is generated for final analysis and reporting of any additional disease-causing variants within genomic target regions present in the larger NGSSM / Myeloid Neoplasms, Comprehensive OncoHeme Next-Generation, Varies.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

16 to 21 days

Performing Laboratory Location

Rochester

Fees & Codes

Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

81450

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
NGSFX	Reanalysis, AML 4 or 11 Gene Panel	99961-5

Result ID	Test Result Name	Result LOINC® Value
MP043	Specimen Type	31208-2
NFXID	Diagnosis/Indication	29308-4
601695	NGSFX Result	No LOINC Needed
601687	Pathogenic Mutations Detected	82939-0
601686	Interpretation	69047-9
601688	Clinical Trials	82786-5
601689	Variants of Unknown Significance	93367-1
601690	Additional Notes	48767-8
601691	Method Summary	85069-3
601693	NGSFX Panel Gene List	36908-2
601694	Reviewed By:	18771-6
601692	Disclaimer	62364-5