MAYO CLINIC LABORATORIES

Test Definition: MPNML

MPL Exon 10 Sequencing, Reflex, Varies

Overview

Useful For

Aiding in the distinction between a reactive cytosis and a myeloproliferative neoplasm when *JAK2*V617F testing result is negative

Evaluates for variants in *MPL* in an algorithmic process for MPNCM / Myeloproliferative Neoplasm, *CALR* with Reflex to *MPL*, Varies.

Method Name

Only orderable as a reflex. For more information see MPNCM / Myeloproliferative Neoplasm, *CALR* with Reflex to *MPL*, Varies.

Sanger Sequencing

NY State Available

Yes

Specimen

Specimen Type

Varies

Specimen Required

Only orderable as a reflex. For more information see MPNCM / Myeloproliferative Neoplasm, *CALR* with Reflex to *MPL*, Varies.

Submit only 1 of the following specimens:

Specimen Type: Blood
Container/Tube: Lavender top (EDTA) or yellow top (ACD solution B)
Specimen Volume: 4 mL
Collection Instructions:
1. Invert several times to mix blood.
2. Send specimen in original tube.
3. Label specimen as blood.
Specimen Stability Information: Ambient (preferred) 7 days/Refrigerate 7 days

Specimen Type: Bone marrow
Container/Tube: Lavender top (EDTA) or yellow top (ACD solution B)
Specimen Volume: 2 mL

Collection Instructions:
1. Invert several times to mix bone marrow.
2. Send specimen in original tube.
3. Label specimen as bone marrow.

Specimen Stability Information: Ambient (preferred) 7 days/Refrigerate 7 days

Specimen Type: Extracted DNA from blood or bone marrow
Container/Tube: 1.5- to 2-mL tube
Specimen Volume: Entire specimen
Collection Instructions: Label specimen as extracted DNA from blood or bone marrow and provide indication of volume and concentration of the DNA.
Specimen Stability Information: Frozen (preferred)/Refrigerate/Ambient

Specimen Minimum Volume

Blood/bone marrow: 0.5 mL

Reject Due To

Gross hemolysis	Reject
Paraffin-embedded bone marrow aspirate clot or biopsy blocks Slides Paraffin shavings Moderately to severely clotted	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Clinical & Interpretive

Clinical Information

JAK2 V617F variant is present in 95% to 98% of polycythemia vera (PV), and 50% to 60% of primary myelofibrosis (PMF) and essential thrombocythemia (ET). Detection of the *JAK2* V617F is useful to help establish the diagnosis of a myeloproliferative neoplasm (MPN). However, a negative *JAK2* V617F result does not indicate the absence of MPN. Other important molecular markers in *BCR-ABL1*-negative MPN include *CALR* exon 9 alterations (20%-30% of PMF and ET) and MPL exon 10 alterations (5%-10% of PMF and 3%-5% of ET). Variants in *JAK2*, *CALR*, and *MPL* are essentially

mutually exclusive. A *CALR* variant is associated with decreased risk of thrombosis in both ET and PMF and confers a favorable clinical outcome in PMF patients. A triple negative (*JAK2* V617F, *CALR*, and *MPL*-negative) genotype is considered a high-risk molecular signature in PMF.

Reference Values

Only orderable as a reflex. For more information see MPNCM / Myeloproliferative Neoplasm, *CALR* with Reflex to *MPL*, Varies.

An interpretive report will be provided.

Interpretation

The results will be reported as 1 of the 3 following states:
-Positive for *CALR* variant
-Positive for *MPL* variant
-Negative for *CALR* and *MPL* variants

Positive variant status is highly suggestive of a myeloid neoplasm and clinicopathologic correlation is necessary in all cases.

Negative variant status does not exclude the presence of a myeloproliferative neoplasm or other neoplasms.

Cautions

A positive result is not specific for a particular subtype of myeloproliferative neoplasm and clinicopathologic correlation is necessary in all cases.

A negative result does not exclude the presence of a myeloproliferative neoplasm or other neoplastic process.

Clinical Reference

1. Klampfl T, Gisslinger H, Harutyunyan AS, et al: Somatic mutation of calreticulin in myeloproliferative neoplasms. N Engl J Med 2013;369:2379-2390
2. Nangalia J, Massie CE, Baxter EJ, et al: Somatic CALR mutation in myeloproliferative neoplasms with nonmutated JAK2. N Engl J Med 2013;369:2391-2405
3. Rotunno G, Mannarelli C, Guglielmelli P, et al: Impact of calreticulin mutations on clinical and hematological phenotype and outcome in essential thrombocythemia. Blood 2014;123:1552-1555
4. Tefferi A, Lasho TL, Finke CM, et al: CALR vs JAK2 vs MPL-mutated or triple-negative myelofibrosis: clinical, cytogenetic and molecular comparisons. Leukemia advance online publication 21 January 2014
5. Pikman Y, Lee BH, Mercher T, et al: MPLW515L is a novel somatic activating mutation in myelofibrosis with myeloid metaplasia. FLoS Med 2006;3:e270
6. Pardanani A, Levine R, Lasho T, et al: *MPL*515 mutations in myeloproliferative and other myeloid disorders: a study of 1182 patients. Blood 2006;15:3472

Performance

Method Description

Genomic DNA was extracted and Sanger sequencing used to evaluate for alterations in *MPL*, exon 10. The sensitivity of this assay is approximately 20%, such that samples containing lower percentages of mutated DNA will appear negative.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
7 to 10 days

Specimen Retention Time
DNA 3 months

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
81339-MPL (myeloproliferative leukemia virus oncogene, thrombopoietin receptor, TPOR) (eg, myeloproliferative disorder), exon 10 sequence