MAYO CLINIC LABORATORIES

Test Definition: MONOF

Monocyte Repartition by CD14/CD16, Blood

Overview

Useful For
Aiding in the diagnosis and monitoring of chronic myelomonocytic leukemia

Method Name
Immunophenotyping

NY State Available
Yes

Specimen

Specimen Type
Whole blood

Ordering Guidance
If cytogenetic tests are requested in addition to this test, an additional specimen tube should be submitted. It is important that the specimen be obtained, processed, and transported according to instructions for the other required test

Shipping Instructions
Specimens must be refrigerated and received within 3 days of collection.

Specimen Required
Container/Tube:
Preferred: Yellow top (ACD solution A or B)
Acceptable: Lavender top (EDTA)
Specimen Volume: 3 mL
Collection Instructions: Send whole blood specimen in original tube. **Do not aliquot.**

Specimen Minimum Volume
1 mL

Reject Due To

Gross hemolysis	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container

Whole blood	Refrigerated	72 hours	

Clinical & Interpretive

Clinical Information

Chronic myelomonocytic leukemia (CMML) is a myelodysplastic syndrome/myeloproliferative neoplasm (MDS/MPN) overlap syndrome characterized by peripheral blood monocytosis (absolute monocyte count > or =1.0 x 10(9)/L, > or =10% of the total white blood cell count) persisting for 3 months or longer. It can be very challenging to distinguish CMML from a reactive monocytosis or from an MPN (such as primary myelofibrosis or polycythemia vera) with monocytosis. Monocytes can be classified into 3 subsets: classical MO1 (CD14+/CD16-), intermediate MO2 (CD14+/CD16+), and non-classical MO3 (CD14-/CD16+) monocytes, with MO1 constituting the major monocyte population (85%) in healthy individuals. Recent reports using multiparametric flow cytometry have demonstrated a characteristic increase in classical monocytes (> or =94%) in CMML patients, thus distinguishing them from other causes of reactive and clonal monocytosis with greater than 90% sensitivity and specificity.(1) This panel is designed to analyze the repartition of monocytes in these patients and to give a semiquantitative value for the MO1 compartment. This value will aid in the differential diagnosis and monitoring of CMML.

Reference Values

% Monocytes of WBC: 1.0-6.6%
MO1 (classical monocytes): <94.0%

Interpretation

An interpretive report describing the classical monocytes (MO1) fraction as either increased or normal will be provided. See Cautions.

Cautions

Typically, an expanded classical monocytes (MO1) fraction has been seen in patients with chronic myelomonocytic leukemia (CMML).(1,2,3) However, it is not diagnostic of CMML. It can be seen in patients with other myeloid neoplasms (eg, myelodysplastic syndrome, myeloproliferative neoplasm, myelodysplastic/myeloproliferative neoplasm, not otherwise specified) or in reactive conditions. A normal MO1 fraction does not rule out a diagnosis of CMML because it may be seen in CMML patients with autoimmune or inflammatory states or post-therapy.

Correlation of these flow cytometry results with bone marrow aspirate and biopsy findings, clinical history, and other laboratory features is required for a definitive diagnosis.

Supportive Data

Clinical Sensitivity and Sensitivity:
Thirty-two patients with untreated chronic myelomonocytic leukemia (CMML) were tested. Twenty-five of these patients had a percent classical monocyte (%MO1) result of greater than or equal to 94% (abnormal result), which correlated to a sensitivity of 78%.

One hundred one patients with non-CMML hematologic malignancies were also tested. Ninety of these patients had a %MO1 result of less than 94% (normal result), which correlated to a specificity of 89%.

In addition, 30 healthy donors also had a %MO1 result of less than 94% (normal result).

Clinical Reference

1. Selimoglu-Buet D, Wagner-Ballon O, Saada V, et al. Characteristic repartition of monocyte subsets as a diagnostic signature of chronic myelomonocytic leukemia. Blood. 2015;125(23):3618-3626. doi:10.1182/blood-2015-01-620781
2. Pophali PA, Marinelli LM, Ketterling RP, et al. High level *MYC* amplification in B-cell lymphomas: is it a marker of aggressive disease? Blood Cancer J. 2020;10(1):5. doi:10.1038/s41408-019-0271-z
3. Patnaik MM, Timm MM, Vallapureddy R, et al. Flow cytometry based monocyte subset analysis accurately distinguishes chronic myelomonocytic leukemia from myeloproliferative neoplasms with associated monocytosis. Blood Cancer J. 2017;7(7):e584. doi:10.1038/bcj.2017.66

Performance

Method Description

Flow cytometric immunophenotyping of peripheral blood is performed to evaluate the percentage of monocytes in the classical (MO1), intermediate (MO2), and non-classical (MO3) compartments. Only the MO1 compartment will be reported. MONOF Panel: CD3, CD7, CD14, CD16, CD24, CD33, CD45, and CD56.(Patnaik MM, Timm MM, Vallapureddy R, et al. Flow cytometry based monocyte subset analysis accurately distinguishes chronic myelomonocytic leukemia from myeloproliferative neoplasms with associated monocytosis. Blood Cancer J. 2017;7[7]:e584. doi:10.1038/bcj.2017.66)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

1 to 4 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

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

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Monocyte Repartition by CD14/CD16, Blood

This test was developed using an analyte specific reagent. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

88184-Flow cytometry; first cell surface, cytoplasmic or nuclear marker
88185 x 7-Flow cytometry; additional cell surface, cytoplasmic or nuclear marker (each)
88187-Flow Cytometry Interpretation, 2 to 8 markers

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
MONOF	Monocyte Repartition by CD14/CD16,B	101146-9

Result ID	Test Result Name	Result LOINC® Value
610019	% Monocytes of WBC	101147-7
610020	MO1 (Classical Monocytes)	101148-5
610023	Final Diagnosis	In Process