MAYO CLINIC LABORATORIES

Test Definition: DCME

Dendritic Cell and Monocyte Enumeration, Blood

Overview

Useful For

Aiding in the diagnosis of patients suspected of defects in innate immunity, particularly those involving monocyte and dendritic cell development

This test has **not** been validated for the diagnosis of hematologic malignancies.

Highlights

This test enumerates plasmacytoid dendritic cells , myeloid dendritic cells , and classical monocytes.

It can be used as part of the diagnostic assessment of patients suspected of defects in innate immunity, particularly those in monocyte and dendritic cell development, which can manifest in isolation or as part of a broader clinical phenotype.

Method Name

Flow Cytometry

NY State Available

Yes

Specimen

Specimen Type

WB Sodium Heparin

Shipping Instructions

Specimens are required to be received in the laboratory weekdays and by 4 p.m. on Friday. Collect and package specimen as close to shipping time as possible.

It is recommended that specimens arrive within 24 hours of collection.

Samples arriving on the weekend and observed holidays may be canceled.

Necessary Information

Ordering physician name and phone number are required.

Specimen Required

Container/Tube: Green top (sodium heparin)
Specimen Volume: 3 mL

Collection Instructions: Send whole blood specimen in original tube. **Do not open tube**. **Do not aliquot.**

Specimen Minimum Volume

1 mL

Reject Due To

Gross hemolysis	Reject
Clotted	Reject
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
WB Sodium Heparin	Ambient	36 hours	GREEN TOP/HEP

Clinical & Interpretive

Clinical Information

Dendritic cells (DC) play a critical role in both innate and adaptive immune responses. DC include 2 major subsets: myeloid (or conventional) dendritic cells (mDC) and plasmacytoid dendritic cells (pDC).

mDC can capture and present antigens to CD4+ T cells and cross-present them to CD8+ T cells. They are also a source of inflammatory cytokines.

pDC take part in priming of antiviral T cells and are the major source of type I interferons; as such they act as a primary defense against viremia.

Monocytes are the archetypal myeloid mononuclear cells. Although human monocytes do have phenotypic heterogeneity, the majority are CD14+ and are classified as classical or inflammatory monocytes.

The list of conditions where this test can be used as part of the assessment include, but are not limited to, GATA-binding protein 2 deficiency, IKZF1 deficiency, IRF8 deficiency, STAT3 gain-of-function disease, HYOU1 deficiency, reticular dysgenesis due to *AK2* variants, WHIM syndrome (warts, hypogammaglobulinemia, infections, and myelokathexis), dedicator of cytokinesis 8 (DOCK8) deficiency, IRF7 deficiency, and Hermansky-Pudlak syndrome type II. In addition, unexplained monocytopenia can be a relevant clue in detecting DC deficiency.

Reference Values

The appropriate reference values will be provided on the report.

Interpretation

Interpretive comments will be provided, where applicable, to complement the reported plasmacytoid dendritic cells, myeloid (or conventional) dendritic cells, and monocyte counts, and their respective reference ranges.

Cautions

Plasmacytoid dendritic cells, myeloid (or conventional) dendritic cells, and monocyte counts should be interpreted in the context of the patient's clinical presentation and in conjunction with other laboratory findings.

The full range of immune defects caused by dendritic cell (DC) deficiency is not yet established. Therefore, not all instances of decreased dendritic cell count can be attributed to an already defined condition.

Reports of a decrease in DC or monocyte counts in patients with a particular deficiency do not necessarily extend to every individual with that deficiency. This can be due to variable expressivity among patients, with no apparent genotype-phenotype correlation, as in the case of GATA-binding protein 2 deficiency, or because the prevalence of these findings and their potential association with specific variants in a particular gene have not been determined, for example in dedicator of cytokinesis 8 (DOCK8) and IRF8 deficiency.

Clinical Reference

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2. Ciancanelli MJ, Huang SX, Luthra P, et al: Infectious disease. Life-threatening influenza and impaired interferon amplification in human IRF7 deficiency. Science. 2015 Apr 24;348(6233):448-453
3. Cytlak U, Resteu A, Bogaert D, et al: Ikaros family zinc finger 1 regulates dendritic cell development and function in humans. Nat Commun. 2018 Mar 27;9(1):1239
4. Dickinson RE, Griffin H, Bigley V, et al: Exome sequencing identifies GATA-2 mutation as the cause of dendritic cell, monocyte, B and NK lymphoid deficiency. Blood. 2011 Sep 8;118(10):2656-2658
5. Haapaniemi EM, Fogarty CL, Keskitalo S, et al: Combined immunodeficiency and hypoglycemia associated with mutations in hypoxia upregulated 1. J Allergy Clin Immunol. 2017 Apr;139(4):1391-1393
6. Haapaniemi EM, Kaustio M, Rajala HL, et al: Autoimmunity, hypogammaglobulinemia, lymphoproliferation, and mycobacterial disease in patients with activating mutations in STAT3. Blood. 2015 Jan;125(4):639-648
7. Hambleton S, Salem S, Bustamante J, et al: IRF8 mutations and human dendritic-cell immunodeficiency. N Engl J Med. 2011 Ju3 14;365(2):127-138
8. Keles S, Jabara HH, Reisli I, et al: Plasmacytoid dendritic cell depletion in DOCK8 deficiency: rescue of severe herpetic infections with IFN-alpha 2b therapy. J Allergy Clin Immunol. 2014 Jun;133(6):1753-1755
9. Pannicke U, Honig M, Hess I, et al: Reticular dysgenesis (aleukocytosis) is caused by mutations in the gene encoding mitochondrial adenylate kinase 2. Nat Genet. 2009 Jan;41(1):101-105
10. Prandini A, Salvi V, Colombo F, et al: Impairment of dendritic cell functions in patients with adaptor protein-3 complex deficiency. Blood. 2016 Jun;127(26):3382-3386
11. Reizis B: Plasmacytoid dendritic cells: Development, regulation, and function. Immunity. 2019 Jan 15;50(1):37-50
12. Tassone L, Moratto D, Vermi W, et al: Defect of plasmacytoid dendritic cells in warts, hypogammaglobulinemia, infections, myelokathexis (WHIM) syndrome patients. Blood. 2010 Dec 2;116(23):4870-4873
13. Vuckovic S, Gardiner D, Field K, et al: Monitoring dendritic cells in clinical practice using a new whole blood single-platform TruCOUNT assay. J Immunol Methods. 2004 Jan;284(1-2):73-87

Performance

Method Description

The method consists of a whole blood no wash assay with a lab-developed polychromatic monoclonal antibody panel. Addition of a flow count bead allows single-platform cellular quantitation reported as cells per microliter of blood. In this panel, plasmacytoid dendritic cells are defined as CD45(+), Lin2(neg), HLA-DR(+), CD123(hi); myeloid dendritic cells as CD45(+), Lin2(neg), HLA-DR(+), CD11c(+); and monocytes as CD45(+)/CD14(+-low). Lineage 2 (Lin2) includes CD3, CD14, CD19, CD20, CD56. Isotype controls to HLA-DR, CD11c, and CD123 are included in this 4-tube test.(Unpublished Mayo method)

PDF Report
No

Report Available
2 to 4 days

Specimen Retention Time
4 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 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
86356 x 3

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
DCME	DC and Monocyte Enumeration, B	In Process

Result ID	Test Result Name	Result LOINC® Value
610368	Monocytes (CD14+)	In Process
610369	pDC (CD123+)	In Process
610370	mDC (CD11c+)	In Process

610371	DCME Comment	In Process