MAYO CLINIC LABORATORIES

Test Definition: CEE49

CD49d Cell Expression Evaluation, Varies

Overview

Useful For

Detecting cell-surface antigens on malignant cells that are potential therapeutic antibody targets, specifically CD49d

Determining the eligibility of patients for monoclonal antibody therapies

Monitoring response to the therapeutic antibody

Testing Algorithm

A complete diagnostic B-cell, T-cell, or acute immunophenotyping panel is **not** performed. In some cases, a limited morphologic evaluation will be performed.

Method Name

Immunophenotyping

NY State Available

Yes

Specimen

Specimen Type

Varies

Ordering Guidance

This test **should not be used** as a shortened diagnostic panel. For a complete diagnostic B-cell, T-cell, or acute immunophenotyping panel, order LCMS / Leukemia/Lymphoma Immunophenotyping, Flow Cytometry, Varies.

This test evaluates CD49d expression only. For CD20 expression, order CEE20 / CD20 Cell Expression Evaluation, Varies. For CD52 expression, order CEE52 / CD52 Cell Expression Evaluation, Varies.

Shipping Instructions

Specimen must arrive within 4 days of collection.

Necessary Information

The following information is required:

1. The therapeutic monoclonal antibody being used or considered

2. The pertinent hematologic diseases that have been diagnosed or considered

3. Specimen source

4. Date and time of collection

Specimen Required

Submit only 1 of the following specimens:

Specimen Type: Whole blood
Container/Tube:
Preferred: Yellow top (ACD solution A or B)
Acceptable: Lavender top (EDTA) or green top (sodium heparin)
Specimen Volume: 10 mL
Collection Instructions:
1. Label specimen as blood.
2. Send specimen in original tube. **Do not aliquot**
Specimen Stability Information: Ambient 4 days/Refrigerated 4 days

Specimen Type: Bone marrow aspirate
Container/Tube:
Preferred: Yellow top (ACD solution A or B)
Acceptable: Lavender top (EDTA) or green top (sodium heparin)
Specimen Volume: 1 to 5 mL
Collection Instructions:
1. Submission of bilateral specimens is not required.
2. Label specimen as bone marrow.
3. Send bone marrow specimen in original tube. **Do not aliquot.**
Specimen Stability Information: Ambient 4 days/Refrigerated 4 days

Forms

If not ordering electronically, complete, print, and send a Hematopathology/Cytogenetics Test Request (T726) with the specimen.

Specimen Minimum Volume

Blood: 3 mL; Bone marrow aspirate: 1 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies	4 days	

Clinical & Interpretive

Clinical Information

Monoclonal antibodies are critical tools for detecting cellular antigens in various hematologic diseases and are used to provide critical prognostic information (CD49d). Monoclonal antibodies are also used as therapeutic agents in a variety of hematologic diseases. For example:
-Anti-CD20 (Rituxan): B-cell malignant lymphomas and multiple myeloma

-Anti-CD52 (Campath-1H): B-cell chronic lymphocytic leukemia and T-cell disorders
This list will undoubtedly expand over time to include other antibodies.

It may be necessary to document expression of these markers by the malignant cells prior to initiating the respective monoclonal antibody therapy. Expression of these markers may also be required for follow-up to monitor the impact of treatment on residual normal counterparts (eg, CD20-positive lymphocytes in patients treated with anti-CD20).

The distribution of these cellular antigens is well established in normal, reactive, and various malignant disorders. The laboratory has several years of experience with therapeutic antibody monitoring of Mayo Clinic patients as part of the routine B-cell, T-cell, or acute immunophenotyping panels.

Reference Values
Normal individuals have B lymphocytes, T lymphocytes, or myeloid cells that express the corresponding cell-surface antigens in question.

Interpretation
The immunophenotyping report will summarize the pattern of antigenic expression on malignant cells and, if appropriate, the normal cellular counterparts that correspond to the therapeutic monoclonal antibody target.

Cautions
No significant cautionary statements.

Clinical Reference
1. Salles G, Barrett M, Foa R, et al. Rituximab in B-cell hematologic malignancies: A review of 20 years of clinical experience. Adv Ther. 2017;34(10):2232-2273. doi:10.1007/s12325-017-0612-x.
2. Braun T, von Jan J, Wahnschaffe L, Herling M. Advances and Perspectives in the Treatment of T-PLL. Curr Hematol Malig Rep. 2020;15(2):113-124. doi:10.1007/s11899-020-00566-5.
3. Piccaluga PP, Cascianelli C, Inghirami G. Tyrosine kinases in nodal peripheral T-cell lymphomas. Front Oncol. 2023;13:1099943. Published 2023 Feb 8. doi:10.3389/fonc.2023.1099943
4. Amhaz G, Bazarbachi A, El-Cheikh J. Immunotherapy in indolent Non-Hodgkin's Lymphoma. Leuk Res Rep. 2022;17:100325. Published 2022 May 18. doi:10.1016/j.lrr.2022.100325
5. Tissino E, Pozzo F, Benedetti D, et al. CD49d promotes disease progression in chronic lymphocytic leukemia: new insights from CD49d bimodal expression. Blood. 2020;135(15):1244-1254. doi:10.1182/blood.2019003179

Performance

Method Description
Flow cytometric immunophenotyping of peripheral blood, bone marrow, or tissue-derived lymphocytes is performed to assess the expression of the cell-surface antigen corresponding to the monoclonal antibody therapeutic target. The following antibody panels will be used:
-Anti-CD49d assessment: CD19/CD49d/CD3/CD45
(Keren P, McCoy Jr JP, Carey J, eds. Flow Cytometry in Clinical Diagnosis. 4th ed. ASCP Press; 2007)

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
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 3-Flow cytometry; additional cell surface, cytoplasmic or nuclear marker
88187-Flow Cytometry Interpretation, 2 to 8 Markers

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CEE49	CD49d Cell Expression Evaluation, V	100993-5

Result ID	Test Result Name	Result LOINC® Value
CK162	CEE49 Result	No LOINC Needed
CK163	Final Diagnosis	22637-3