Leukemia/Lymphoma Phenotyping Evaluation by Flow Cytometry

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Leukemia and lymphoma analysis by flow cytometry aids in identifying the tumor lineage, which in most cases is identified as T cell, B cell, or myeloid. Lineage identification can provide a confirmatory diagnosis or differential diagnosis, prognosis, and treatment options.

Disease Overview

Diagnosis/Treatment Issues

- Phenotyping by flow cytometry can aid in the evaluation of hematopoietic neoplasms.
  - Specimens include bone marrow, whole blood, tissue, or fluid.
- Phenotyping may aid in monitoring response to therapy in individuals with an established diagnosis of hematopoietic neoplasms.

Test Interpretation

- Markers are analyzed as needed, based on clinical evidence, to fully characterize any abnormalities identified by the screening panel.
  - Additional markers are selected based on pathologist interpretation of the screening panel results.
- Antigens included:
  - T cell: CD1a, CD2, CD3, CD4, CD5, CD7, CD8, TCR γ-δ, cytoplasmic CD3
  - B cell: CD10, CD19, CD20, CD22, CD23, CD103, CD200, kappa, lambda, cytoplasmic kappa, cytoplasmic lambda
  - Myeloid/monocyte: CD11b, CD13, CD14 (Mo2), CD14 (MY4), CD15, CD33, CD64, CD117, myeloperoxidase
- Miscellaneous: CD11c, CD16, CD25, CD30, CD34, CD38, CD41, CD42b, CD45, CD56, CD57, CD61, HLA-DR, glycophorin, TdT, bcl-2, ALK-1, CD123, CD138, CD200, CD26, CD45, CRLF-2

Clinical Sensitivity

Limit of detection is 0.01–1.0% depending on phenotype and disease.

Results

- Antigens will be reported as positive or negative.
- Interpretive comments that further characterize intensity patterns are included.
  - Dim, bright, variable, or partial may be reported.
- Light-chain expression may be reported as polytypic/polyclonal or restricted/monotypic/monoclonal.
  - May include kappa/lambda ratio.
- Pattern of CD antigen testing will be interpreted with recommendations for further testing, if indicated.

Limitations

- Some hematopoietic neoplasms do not show phenotypic abnormalities and may not be detected by flow cytometry.
- Poor cell viability may adversely affect antigens and impede the ability to properly identify neoplastic cells.
- Flow results cannot be used alone to diagnose malignancy.
  - Results should be interpreted in conjunction with morphology, clinical information, and other necessary ancillary tests for a definitive diagnosis.

Related Testing Strategy Information

Leukemia/Lymphoma	ARUP Consult Resource
Acute leukemia	• Acute Lymphoblastic Leukemia - ALL • Acute Myeloid Leukemia - AML

Leukemia/Lymphoma	ARUP Consult Resource
Follicular, Burkitt, or diffuse large B-cell lymphoma	• Mature B-Cell Lymphomas • T-Cell and NK-Cell Lymphomas
Chronic lymphocytic leukemia, small lymphocytic lymphoma, hairy cell leukemia, and mantle cell lymphoma	• Chronic Lymphocytic Leukemia - CLL • Mature B-Cell Lymphomas

Related Information

Hematologic Malignancies
Minimal Residual Disease Testing

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