

Leukemia/Lymphoma Phenotyping by Flow Cytometry

Indications for Ordering

- Aid in evaluation of hematopoietic neoplasms (eg, leukemia, lymphoma)
 - Specimens include peripheral blood, bone marrow, or tissue
- Monitor response to therapy in individuals with established diagnosis of hematopoietic neoplasms

Test Description

- Five-color flow cytometry
 - A screening panel of markers will be ordered based on provided clinical information and/or previous test results
 - Additional markers may need to be analyzed to fully characterize any abnormalities identified by the screening panel
 - This set of markers will be chosen by the pathologist who interprets the screening panel
- Antigens included
 - T cell – CD1, CD2, CD3, CD4, CD5, CD7, CD8, TCR α - β , TCR γ - δ , cytoplasmic CD3
 - B cell – CD10, CD19, CD20, CD22, CD23, CD103, kappa, lambda, FMC7, 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

Tests to Consider

Primary test

[Leukemia/Lymphoma Phenotyping by Flow Cytometry 2008003](#)

- Aid in evaluation of hematopoietic neoplasms
- Monitor therapy in patients with established diagnosis of hematopoietic neoplasms

Related tests

Acute leukemia diagnosis

- [Acute Lymphocytic Leukemia \(ALL\) Panel by FISH, Adult 2002647](#)
- [Acute Lymphocytic Leukemia \(ALL\) Panel by FISH, Pediatric 2002719](#)
- [Chromosome FISH, Interphase 2002298](#)
- [Cytogenomic SNP Microarray - Oncology 2006325](#)

- [Acute Myeloid Leukemia Panel by FISH 2011132](#)
- [Acute Myelogenous Leukemia \(AML\) with Myelodysplastic Syndrome \(MDS\) or Therapy-Related AML, by FISH 2002653](#)
- [PML-RARA Translocation by FISH 2002363](#)
- [PML-RARA Translocation, t\(15;17\) by RT-PCR, Quantitative 2002871](#)
- [CBFB-MYH11 inv\(16\) Detection, Quantitative 2011114](#)
- [RUNX1-RUNX1T1 \(AML1-ETO\) t\(8;21\) Detection, Quantitative 2010138](#)

Follicular, Burkitt, or diffuse large cell lymphoma diagnosis

- [Chromosome FISH, Interphase 2002298](#)
- [IGH-BCL2 Fusion, t\(14;18\) by FISH 2001536](#)
- [MYC \(8q24\) Gene Rearrangement by FISH 2002345](#)
- [IGH-MYC Fusion t\(8;14\) by FISH 2001538](#)
- [Aggressive B-Cell Lymphoma FISH Reflex, Tissue 2012710](#)
- [Lymphoma \(Aggressive\) Panel by FISH 2002650](#)

Mantle cell lymphoma diagnosis

- [Cyclin D1, SP4 by Immunohistochemistry 2003842](#)
- [SOX11 by Immunohistochemistry 2012561](#)
- [IGH-CCND1 Fusion, t\(11;14\) by FISH 2007226](#)
- [Chromosome FISH, Interphase 2002298](#)

Chronic lymphocytic leukemia prognostication

- [Chromosome FISH, Interphase 2002298](#)
- [Cytogenomic SNP Microarray - Oncology 2006325](#)
- [IGHV Mutation Analysis by Sequencing 0040227](#)

Hairy cell leukemia diagnosis

- [BRAF V600E Mutation Detection in Hairy Cell Leukemia by Real-Time PCR, Quantitative 2007132](#)

Disease Overview

Diagnosis/treatment issues

- Phenotyping by flow cytometry helps to establish diagnosis for hematopoietic neoplasms
- Phenotyping may aid in monitoring therapy in individuals with established diagnosis

Test Interpretation

Clinical sensitivity – limit of detection 0.01-1.0% depending on phenotype and disease

Results

- Antigens will be reported as positive or negative
 - Positive result will be reported as percentage
- Interpretive comments are included that further characterize intensity patterns
 - Dim, bright, variable, or partial may be reported
- Light-chain intensity will be reported as high, low, or restricted
 - May include kappa/lambda ratio
- Pattern of CD antigen testing will be interpreted with possible suggestions for further testing if indicated

Limitations

- Some hematopoietic neoplasms do not show phenotypic abnormalities and therefore 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
 - Should be interpreted in conjunction with morphology, clinical information, and other necessary ancillary tests for a definitive diagnosis