Leukemia/Lymphoma Phenotyping by Flow Cytometry

Indications for Ordering

- Aid in evaluation of hematopoietic neoplasms (e.g., 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, CD61, HLA-DR, glycoporin, 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
- IGHV Mutation Analysis by Sequencing 0040227

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