Hematolymphoid Screening Panel

Multiparametric Flow Cytometry

CAP/CLIA Validated

Clinical Information

The 10-color Hematolymphoid Screening Panel provides a comprehensive approach for evaluating bone marrow and peripheral blood samples for the presence or absence of hematolymphoid malignancies. The panel characterizes and identifies all major white blood cell lineages and identifies all major types of hematopoietic neoplasia. Biomarker selection follows the 2006 Bethesda Consensus[1] for immunophenotypic analysis of hematolymphoid neoplasia with additions chosen by our internal hematopathologist based on recent literature including the 2017 WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues.[2-8]

This panel not only enables evaluation of patients with hematological malignancies, but provides a wide array of applications due to its comprehensive biomarker selection.

Biomarkers in the Screening Panel		
CD2	CD3	CD4
CD5	CD7	CD8
CD10	CD11b	CD13
CD14	CD15	CD16
CD19	CD20	CD23
CD33	CD34	CD38
CD45	CD56	CD57
CD64	CD71	CD117
CD123	HLA-DR	Kappa
Lambda	TCR Gamma/Delta	

Indications for Testing

- Classifying Acute Leukemia
- Diagnosing and Classifying B-cell Disorders
- Evaluating T-cell and NK disorders
- Evaluating Plasma Cell Dyscrasias

Key Points

- 10-color Flow Panel
- Global Standardized Testing through LabPMM Network
- Flow and NGS Testing Available
- Accurate Results Comparisons - No Sample Splitting
- 2006 Bethesda Consensus and 2017 WHO Classification Guidance

Interpretation	Turnaround Time	Specimen Requirements	Shipping Conditions	Storage Conditions
An interpretive report will be issued for the interrogated sample indicating presence/ absence of normal and abnormal cell populations and their associated immunophenotypic profile.	24 - 48 hours	2-4 mL of bone marrow or peripheral blood in EDTA or Sodium Heparin	Ambient or Cool Do not freeze	2-8 °C up to 7 days

References

1. BL Wood et al., *Cytometry B Clin Cytom.* 72:S14-S22 (2007). 2. FE Craig et al., *Blood.* 111(8):3941-67 (2008). 3. BL Wood. *Arch Pathol Lab Med.* 130:680-90 (2006) 4. SH Swerdlow et al., WHO *Classification of Tumours,* Revised 4th Edition, Volume 2 (2017) 5. CLSI H43: *Clinical Flow Cytometric Analysis of Neoplastic Hematolymphoid Cells,* 2nd Edition 6. JJ Van Dongen et al., *Leukemia.* 26(9):1908-75 (2012). 7. A Porwit and A Rajab. *Int. Jnl. Lab. Hem.,* 37:133-143 (2015). 8. Sheikholeslami et al., *Methods in Molecular Biology.* 378. 53-63. 10.1007/978-1-59745-323-3_4 (2007).

Case of Acute Myeloid Leukemia (AML)

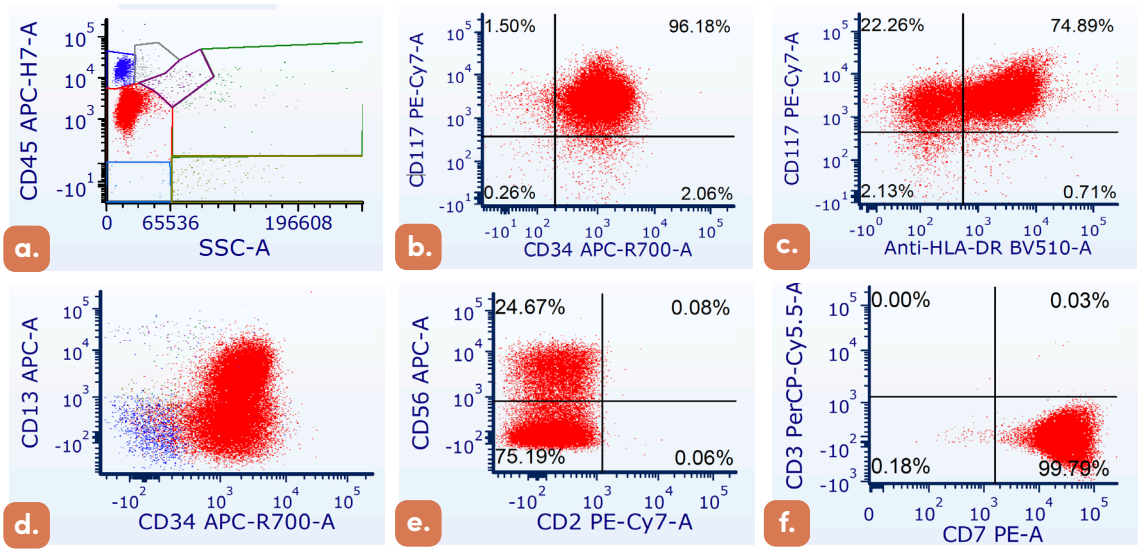

Fig. 1 Representative plots from a case of acute myeloid leukemia (HLADR positive) with aberrant lymphoid antigen expression. Peripheral blood was used for flow cytometry immunophenotype screening for leukemia and lymphoma. Expanded population of aberrant myeloid blasts were identified in support of the final AML diagnosis. **a.** Gating scheme based on CD45 expression and side scatter properties to help separate lymphoid (blue), granulocytes (green), monocytes (gray), blasts/precursors (red) and debris (black) and other cells (yellow) and shows expanded population of blasts/precursors **b.** Blasts co-express both CD34 and CD117 (progenitor/immaturity markers) **c.** HLADR is expressed in a subset of blasts **d.** CD13 is expressed in a subset of blasts **e.** CD56 is expressed in subset of blasts (aberrant lymphoid antigen expression by myeloid blasts) **f.** Blasts express CD7 (aberrant lymphoid antigen expression by myeloid blasts)

Case of Chronic Lymphocytic Leukemia (CLL) / Small Lymphocytic Lymphoma (SLL)

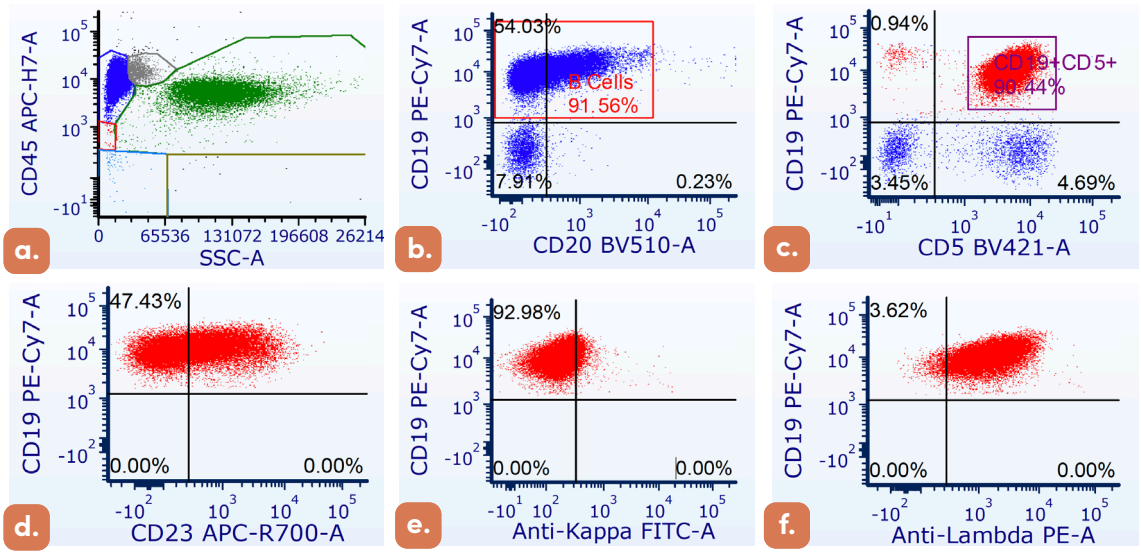

Fig. 2 Representative plots from a case of CLL/SLL.. Peripheral blood was used for a flow cytometry immunophenotype screen for leukemia and lymphoma. CD5 co-expressing lambda monoclonal mature B-cell population was identified: a total of 55% of total cells displayed a CLL/SLL immunophenotype. **a.** Gating scheme based on CD45 expression and side scatter properties to help separate lymphoid (blue), granulocytes (green), monocytes (gray), blasts/precursors (red) and debris (black) and other cells (yellow) and shows expanded population of lymphocytes **b.** Increased B lymphocytes (91%) which coexpress both CD19 (bright) and CD20 (dimmer) **c.** B-cells coexpress T-cell antigen CD5 with CD19 (aberrant expression in B-cells, characteristic of CLL, Mantle cell lymphoma, rarely in other B-cell neoplasia) **d.** Significant number of B-cells coexpress CD23 with CD19 (Common with CLL/SLL opposed to Mantle cell lymphoma) **e.** CD19 VS. kappa: Kappa negative in neoplastic B-cells **f.** CD19 VS. Lambda: Lambda positive/ clonality in neoplastic B-cells

Some hematopoietic neoplasms do not show immunophenotypic abnormalities, and may not be detected by flow cytometry. Hence, results should be interpreted in context of morphology, clinical information, and other necessary ancillary tests (such as molecular genetic testing etc.) for a definitive diagnosis. Figures are for illustration purposes only.