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T-CELL CLONALITY INFORMATION SHEET

T-cell lymphomas comprise about 10% of all lymphomas, and flow cytometry makes an important contribution to their detection. Aberrant T-cell populations may be difficult to identify and assessment of clonality is required. The SydPath Flow Cytometry Laboratory has substantial expertise in assessing clonality by determination of TCR Vβ chains, using a panel of 24 monoclonal antibodies. However, this method is time-consuming, and expensive. Additionally, some monoclonal populations may be missed because antibodies are available to only 24 of the approximately 40 different TCR Vβ specificities. TCR Vβ analysis only positively detects about two thirds of cases of T-cell neoplasms (1)

Recently, assessment of the T-cell receptor beta chain constant domain 1 (TRBC1) by the monoclonal antibody JOVI-1 has emerged as an effective way to identify monoclonal T-cell populations. Each αβ T-cell uses either the TRBC1 or the TRBC2 gene, but not both. In normal and reactive T-cell populations, slightly fewer than half of the cells express TRBC1, whereas in monoclonal populations, all cells are either positive or negative for TRBC1 (2, 3). In our hands, TRBC1 is very sensitive in detecting monoclonal T-cell populations in peripheral blood, bone marrow and other tissue samples.

Therefore, we now evaluate TRBC1 as the preferred method for assessment of T-cell monoclonality. We continue to use the TCR Vβ panel in complex cases, and for samples in which the TRBC1 result is borderline. As TRBC1 is not useful in assessment of oligoclonality, on request, we will continue to use the TCR Vβ panel to assess this in cases of suspected or known primary immunodeficiency (4).

References:

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3. Novikov ND et al. Utility of a Simple and Robust Flow Cytometry Assay for Rapid Clonality Testing in Mature Peripheral T-Cell Lymphomas. Am J Clin Pathol. 2019 Apr 2;151(5):494-503.
4. Gennery AR et al. Omenn's syndrome occurring in patients without mutations in recombination activating genes. Clin Immunol. 2005 Sep;116(3):246-56.