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INVESTIGATING MATURE T-CELL CLONALITY BY FLOW CYTOMETRY WITH NOVEL ANTI-TRBC1

INTRODUCTION

The T-cell receptor (TCR) β-chain constant region 1 (TRBC1) is a novel flow cytometry marker, incorporated into routine diagnostic panels for the investigation of mature aβ T-cell lymphoid proliferations.

TRBC1 UTILISATION

TRBC1 is a fast, cost-effective and robust method for aβ T-cell clonality assessment, supporting the diagnosis of T-cell neoplasia.

TRBC1 FLOW CYTOMETRY ASSESSMENT PRINCIPLE

The T-cell receptor β-chain constant regions 1 and 2 show mutually exclusive expression after TRβ gene rearrangement within the thymus. Reactive T-lymphoid proliferations may be distinguished from clonal T-lymphocytes, by demonstrating monotypic TRBC1 expression during the assessment TRBC1+/ TRBC1- ratios, within distinct mature post-thymic aß T-cell subsets. Bimodal TRBC1 expression is characteristic of polyclonal mature aß T-lymphocytes. The analysis principle is similar to the kappa/lambda light chain ratio assessment on mature B-lymphocytes.

TRBC1 FLOW CYTOMETRY PANEL

TRBC1 expression is assessed alongside pan T-cell markers, namely surface CD3, CD4, CD8, CD2, CD5, CD7, as well as TCRγδ and CD45. Mature aβ T-cell subsets are assessed for monotypia and aberrant antigen expression, after the exclusion of mature γδ T-cells. The TRBC1 panel is performed in conjunction with a lymphoid screening tube (LST) with additional lymphoid markers present, including CD56 and CD38.

TRBC1 FLOW CYTOMETRY ASSESSMENT BENEFITS

Most clonal mature T-lymphoid proliferations express TCRaβ, and thus afford broad applicability in their investigation. Blood, bone marrow and body fluids may be submitted for investigation. Conventional TCR γ and/or β gene rearrangement by PCR analysis is costly, complex and often involves lengthy turnaround times and provides no information on the size of the T-cell clone.

CONCLUSION

A cost-effective and fast-flow cytometry assay is available for patients in which a clonal mature aβ T-lymphoid proliferation is suspected.

For more information, contact the Flow Cytometry Laboratory on 012 678 0587.