Human and Mouse Naïve/Memory T-Cell Panels

Features

- Flexible panels of the most commonly used markers for the identification of naïve and memory T cells

- Formats and concentration optimized for each specificity to work as a combined panel

- Human panel contains CD3, CD4, CD45RA, and CD197 (CCR7) in four vials conveniently bottled at 5 µL per test with the PE channel open

- Mouse panel contains CD3, CD4, CD44, and CD62L with the FITC channel open

- Basic panels are compatible with dual-laser flow cytometers such as the BD FACSCalibur™

Optimized reagent panels for the measurement of naïve, memory, and effector T-cell populations

The ability of the immune system to respond with greater intensity upon re-exposure to antigen forms the basis of immunological memory. The understanding of immunologic memory is important for the study of vaccine development, infectious disease, and immune reconstitution. BD offers convenient optimized panels of the essential markers for the study of T cell memory for human and mouse. The panels are compatible with various markers to provide a convenient and consistent base for studies of T-cell memory.

Markers for the study of naïve, memory, and effector T-cell populations

The relative number of different T-cell subsets, activation markers, and growth factors can provide a useful measurement of immune response to antigen. Different subsets are defined by patterns of cytokine production and cell surface marker expression, some of which are summarized in table 1. Several markers have been described as useful for the identification of T cell subsets.[1,2,3] Memory T cells form a heterogeneous group of long-lived cells which are characterized phenotypically by high expression levels of CD45RO in humans and CD44 in mice. Both in humans and mice, most typical memory cells are resting cells and comprise a mixture of "central" and "effector" cells. Central memory cells retain the lymph node (LN)-homing receptors CCR7 and CD62L (L-selectin) on naïve T cells and, like the latter, recirculate through spleen and LN. Effector memory cells, on the other hand, downregulate CD62L and express a diverse set of homing receptors, which enables the cells to pass through non-lymphoid tissues. Some effector memory cells are in an activated state and are common in chronic viral infections.[4-7]

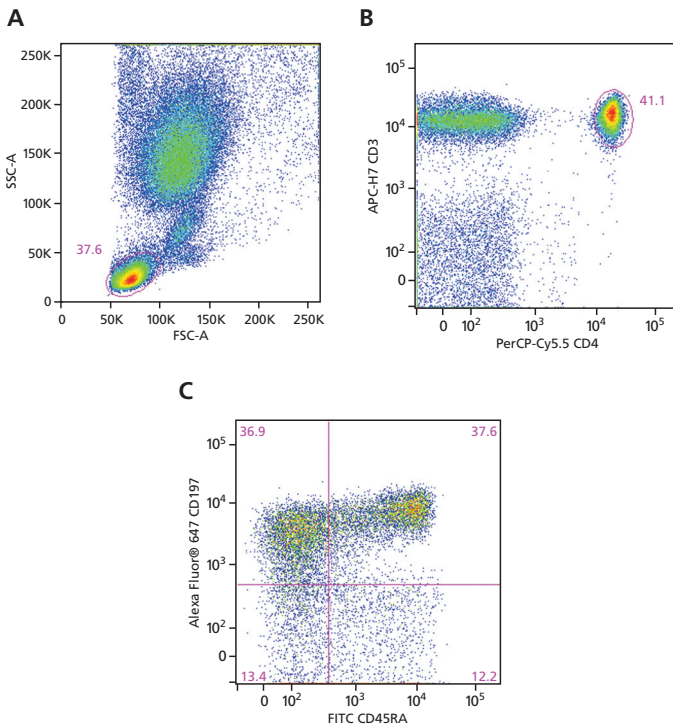Visit **bdbiosciences.com/tcell** for more information.

Figure 1. Multicolor staining and flow cytometric analysis of peripheral blood naïve and memory CD4+ T cells on a BD FACSCanto™ II flow cytometer.

Whole blood was stained with a combination of PerCP-Cy™5.5 mouse anti-Human CD4, FITC mouse anti-Human CD45RA, Alexa Fluor® 647 mouse anti-Human CD197 (CCR7), and APC-H7 mouse anti-Human CD3 antibody. Red blood cells were then lysed using BD PharmLyse™ lysing buffer (Cat. No. 555899) and the leucocytes were analyzed. Bivariate dot plots showing the correlated expression patterns of CD45RA vs CD197 (plot C) were derived from gated events with the light-scattering characteristics of viable CD4+CD3+ T lymphocytes (plot B) which were generated by flow cytometric analysis. Quadrants for the dot plots were derived using fluorescence-minus-one (FMO) controls.

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Table 1. Common markers for the study of T-cell memory.

Specificity	Function	Utility	Panel(s)
CD3	Part of the T-cell receptor complex	T-cell lineage marker	Human and Mouse
CD4	Initiates or augments the early phase of T-cell activation	T helper cell lineage marker	Human and Mouse
CD8	T-cell mediated killing	T effector cell lineage marker	–
CD11a	Involved in leucocyte interactions	Levels increase with antigen experience	–
CD14	Mediates the innate immune response to lipopolysaccharides	Macrophage marker (eliminates contaminating cells)	–
CD19	Assembles the antigen receptor of B lymphocytes	B-cell marker (eliminates contaminating cells)	–
CD25	Identification of regulatory T cells	Treg marker	–
CD27	Important for the generation and maintenance of immune response.[4]	Levels decrease upon antigen experience	–
CD28	T-cell activation	Levels decrease upon antigen experience	–
CD44	Promotes effector T cell survival[5]	Memory marker. In mouse levels are increased in memory and effector T cells	Mouse

Specificity	Function	Utility	Panel(s)
CD45RA	Regulator of T-cell antigen signaling	Memory marker. Levels increase with antigen experience.	Human
CD45RO	Regulator of T-cell antigen signaling	Memory marker	–
CD57	Cell adhesion	Terminal differentiation marker.	–
CD62L	Cell adhesion/trafficking to lymph nodes	Memory marker. Levels increase in memory T cells	Mouse
CD69	T-cell activation marker	T-cell activation marker	–
CD122	Subunit of the IL-2 receptor	Possible memory cell marker[3]	–
CD127	IL-7 receptor	Useful for the negative selection of Tregs	–
CD197 (CCR7)	Homing receptor	Levels decrease with antigen experience	Human
IFN-γ	Immunomodulatory cytokine	Access immune function	–
IL-2	Cytokine important for the expansion of CD4 and CD8 T cells	Access immune function	–
TNF	Proinflammatory cytokine	Access immune function	–

Ordering Information

Description	Clone	Isotype	Format	Size	Cat.No.
Human Naïve/Memory T Cell Panel Containing the following Anti-Human Reagents				50 tests	**561438**
CD3	SK7	Mouse IgG$_1$, κ	APC-H7		
CD4	SK3	Mouse IgG$_1$, κ	PerCP-Cy5.5		
CD45RA	HI100	Mouse IgG$_{2b}$, κ	FITC		
CD197 (CCR7)	150503	Mouse IgG$_{2a}$, κ	Alexa Fluor® 647		
Mouse Naïve/Memory T Cell Panel Containing the following Anti-Mouse Reagents				50 tests	**561609**
CD3 Molecular Complex	17A2	Rat IgG$_{2b}$, κ	APC-Cy™7		
CD4	RM4-5	Rat IgG$_{2a}$, κ	PerCP-Cy5.5		
CD44	IM7	Rat IgG$_{2b}$, κ	PE		
CD62L	MEL-14	Rat IgG$_{2a}$, κ	APC		

References

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