

# BD Pharmingen CD4<sup>+</sup> T Cell Phenotyping Kits

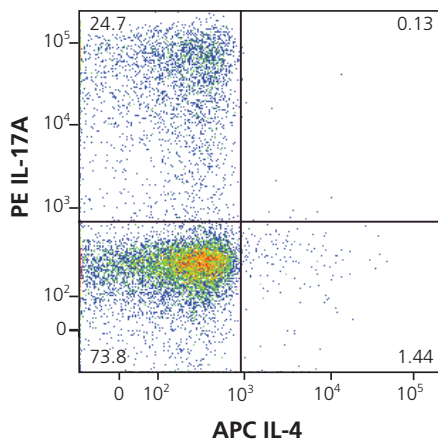
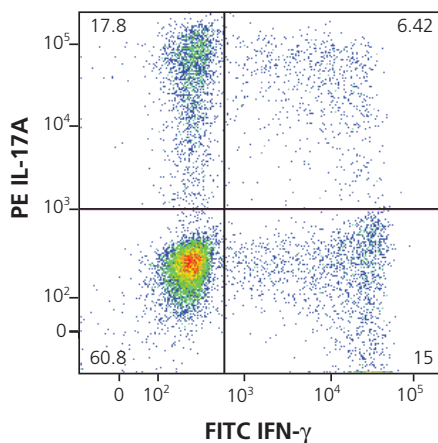
## Essential tools for studying T-cell differentiation

### Features

Easy-to-use kits that allow for detection of multiple CD4<sup>+</sup> T-cell subsets in each sample

Optimized to provide flexibility by enabling additional markers to be added for further characterization of subpopulations

One-step staining protocol using optimized buffer systems



### Flow cytometric analysis of a Th17 culture using the Human Th1/Th2/Th17 Phenotyping Kit

Human PBMCs were stimulated for 13 days with anti-CD3 and anti-CD28 monoclonal antibodies in the presence of recombinant IL-6, TGF- $\beta$ , IL-1 $\beta$ , and IL-23, as well as anti-IFN- $\gamma$  and anti-IL-4 neutralizing antibodies. Harvested cells were stained according to the kit procedure and analyzed on a BD™ LSR II flow cytometer. Dot plots are based on a CD4<sup>+</sup> lymphocyte gate.

The BD Pharmingen™ CD4<sup>+</sup> T-cell phenotyping kits provide a simple solution for measurement of multiple cytokines or transcription factors from a single sample using multicolor flow cytometry. These kits allow for staining of surface CD4 along with intracellular factors such as IFN- $\gamma$ , IL-4, IL-17A, and FoxP3. Depending on the kit, researchers can simultaneously look at Th1, Th2, and Th17 cells; Th1 and Th17 cells; or Th17 and regulatory T cells in mouse or human model systems.

### Essential tools for research in the area of T-cell differentiation

The discovery of the novel Th17 and inducible regulatory T cell (iTreg) CD4<sup>+</sup> subsets has driven many researchers to revisit the classic Th1/Th2 paradigm for elucidating the key subsets involved in a given T-cell response. Lacking unique surface markers, the signature molecules for each of these cell types are intracellular cytokines or transcription factors:

Cell Type	Signature Marker
Th1	IFN- $\gamma$
Th2	IL-4
Th17	IL-17A
Treg	FoxP3

Recent publications suggest plasticity between the various CD4<sup>+</sup> lineages.<sup>1,2</sup> Due to its ability to look at a heterogeneous cell population at the single-cell level, multicolor flow cytometry is well suited for determining the phenotypes of the subpopulations in a sample.

### A streamlined workflow

Based on established protocols, these kits have been optimized for simultaneous staining of surface and intracellular markers. After stimulation of cells in the presence of BD GolgiStop™ protein transport inhibitor, cells are harvested and washed. This is followed by fixation and permeabilization and subsequent staining with the antibody cocktail and flow cytometric analysis. For those wishing to add additional markers to their analysis, the Technical Data Sheet for each kit includes information on common staining surface markers that have been screened in this one-step staining protocol.

Visit [bdbiosciences.com/tcell](http://bdbiosciences.com/tcell) for more information.

## BD Pharmingen CD4<sup>+</sup> T Cell Phenotyping Kits

BD Biosciences is pleased to offer staining kits for human and mouse research that include a CD4 antibody conjugated to PerCP-Cy™5.5, antibodies to the different signature molecules, an optimized fixation and permeabilization buffer system, and a one-step staining protocol.

### References

1. Zhou L, Chong MMW, Littman DR. Plasticity of CD4<sup>+</sup> T Cell Lineage Differentiation. *Immunity* 2009;30(5):646-655.
2. Bettelli E, Carrier Y, Gao W, Korn T, Strom TB, Oukka M, et al. Reciprocal developmental pathways for the generation of pathogenic effector TH17 and regulatory T cells. *Nature* 2006;441(7090):235-238.

### Ordering Information

Description	Contents	Size	Cat. No.
Human Th1/Th2/Th17 Phenotyping Kit	Human Th1/Th2/Th17 Phenotyping Cocktail (CD4 PerCP-Cy5.5, IFN-γ FITC, IL-17A PE, IL-4 APC) BD Cytotfix™ Fixation Buffer, BD Perm/Wash™ Buffer, BD GolgiStop™ Protein Transport Inhibitor	50 Tests	560751
Human Th1/Th17 Phenotyping Kit	Human Th1/Th17 Phenotyping Cocktail (CD4 PerCP-Cy5.5, IFN-γ FITC, IL-17A PE) BD Cytotfix Fixation Buffer, BD Perm/Wash Buffer, BD GolgiStop Protein Transport Inhibitor	50 Tests	560752
Human Th17/Treg Phenotyping Kit	Human Th17/Treg Phenotyping Cocktail (CD4 PerCP-Cy5.5, IL-17A PE, FoxP3 Alexa Fluor® 647) FoxP3 Buffer Set, BD GolgiStop Protein Transport Inhibitor	50 Tests	560762
Mouse Th1/Th2/Th17 Phenotyping Kit	Mouse Th1/Th2/Th17 Phenotyping Cocktail (CD4 PerCP-Cy5.5, IFN-γ FITC, IL-17A PE, IL-4 APC) BD Cytotfix Fixation Buffer, BD Perm/Wash Buffer, BD GolgiStop Protein Transport Inhibitor	50 Tests	560758
Mouse Th1/Th17 Phenotyping Kit	Mouse Th1/Th17 Phenotyping Cocktail (CD4 PerCP-Cy5.5, IFN-γ FITC, IL-17A PE) BD Cytotfix Fixation Buffer, BD Perm/Wash Buffer, BD GolgiStop Protein Transport Inhibitor	50 Tests	560759
Mouse Th17/Treg Phenotyping Kit	Mouse Th17/Treg Phenotyping Cocktail (CD4 PerCP-Cy5.5, IL-17A PE, Foxp3 Alexa Fluor® 647) Foxp3 Buffer Set, BD GolgiStop Protein Transport Inhibitor	50 Tests	560767



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