A New Pole in Helper T Cells: Th17 Polarization

The recently described Th17 lineage is another subset of $CD4^+$ effector T cells that is distinct from, and antagonized by, the Th1 and Th2 lineages. In the mutual presence of interleukin (IL)-6 and transforming growth factor (TGF)-β, activated Th_0 cells express the transcription factor RORγt, leading to the predominant secretion of IL-17(A, F) and IL-22. In addition, IL-23 is essential for expansion and maintenance of this lineage. Mounting evidence indicates that Th17 cells, similar to Th1 and Th2 cells, are essential players in the response to specific pathogens, and when not properly regulated, can lead to autoimmune pathologies. Studies find elevated numbers of Th17 cells in wild-type mice relative to IL-23-deficient mice and suggest an important role for IL-23 and/or IL-17 in several extracellular bacterial infection models. Studies with IL-23 knockout mice have also implicated Th17 cells in autoimmune models experimental autoimmune encephalitis (EAE) and collagen-induced arthritis (CIA). IL-22 is an IL-10 cytokine family member that has recently been identified as an inflammatory mediator of psoriasis by signaling through STAT3 in endothelial cells. STAT3, activated by IL-6 and IL-23, is also critical for Th17 differentiation and expansion.

Th Subset-related Molecules

MOLECULE	ANTIBODIES	PROTEINS	ELISAs/ASSAYS	PRIMER PAIRS
CXCR3	H M			M R
Fas/TNFRSF6	H M R F	H M R F	H M	H M
ICOS	H M	H M		
IFN-γ	H M R B Ca CR E F P Pr	H M R B Ca CR E F P Pr	H M R Ca CR F P Pr	H M R
IFN-γ R1	H M	H M	H M	
IFN-γ R2	H M			
IL-12	H M R P	H M R Ca F P Pr	H M	H M R
IL-12 R β1	H M	H M		
IL-12 R β2	H	H		
IL-12/IL-23 p40	H M R Ca F P	H M Ca F	H M P	H M R
IL-17	H M	H M	H M	H M
IL-17F	H M	H M		
IL-17 R	H M	H M		
IL-17B R	H M	H M		
IL-18 Rα/IL-1 R5	H M	H		H
IL-22	H M	H M R	H M R	
IL-22 BP	H M	H M		
IL-22 R	H	H		
IL-23	H M	H M R		
IL-23 R	H M	H M		
IL-27	H M	H M	M	H M
IL-4	H M R B Ca CR E F P	H M R B Ca CR E F P Pr	H M R CR F P	H M
IL-4 R	H M	H M		
IL-6	H M R Ca CR E F P	H M R Ca CR E F P	H M R Ca P	H M R
IL-6 R	H M	H M	H	
STAT3	H M R		H M	
TGF-β 1	H	H M P	H M R Ca P	H M
TGF-β RI/ALK-5	H M	M		
TGF-β RII	H M	H M		
TGF-β RIIb	H	H		
TRAF-6	H			
TRANCE/RANK L/ TNFSF11	H M	H M	M	H M

Key: B Bovine Ca Canine CR Cotton Rat E Equine F Feline H Human M Mouse P Porcine Pr Primate R Rat

Cell Surface Staining of IL-23 R by Flow Cytometry

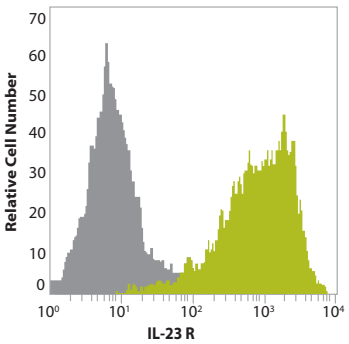

Figure 1. IL-23 R was detected in human erythroleukemia cells (K562) with anti-human IL-23 R (Catalog #AF1400; green histogram) or isotype control antibody (Catalog # AB-108-C; gray histogram). Cells were stained with PE-conjugated anti-goat antibody (Catalog #F0107).

ELISpot Detection of IL-17-producing Splenocytes

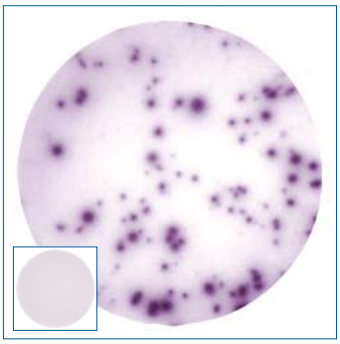

Figure 2. Mouse splenocytes (10^5 cells per well) were cultured in the absence (inset) or presence of PMA and calcium ionophore. The frequency of IL-17 producing cells was measured with the mouse IL-17 ELISpot kit (Catalog # EL421).

Intracellular Detection of IL-17 by Flow Cytometry

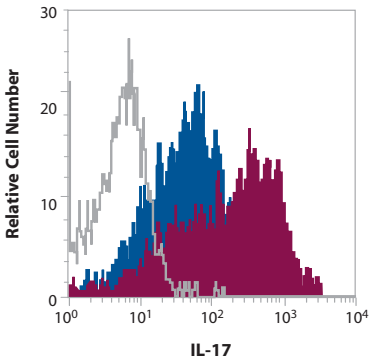

Figure 3. Intracellular staining with anti-human IL-17-APC (Catalog # IC3171A) in human lymphocytes (blue), and human lymphocytes treated with PMA and calcium ionophore (red). Human lymphocytes stained with isotype control (Catalog # IC002A) are represented by the open histogram.