R&D Systems Tools for Cell Biology Research™

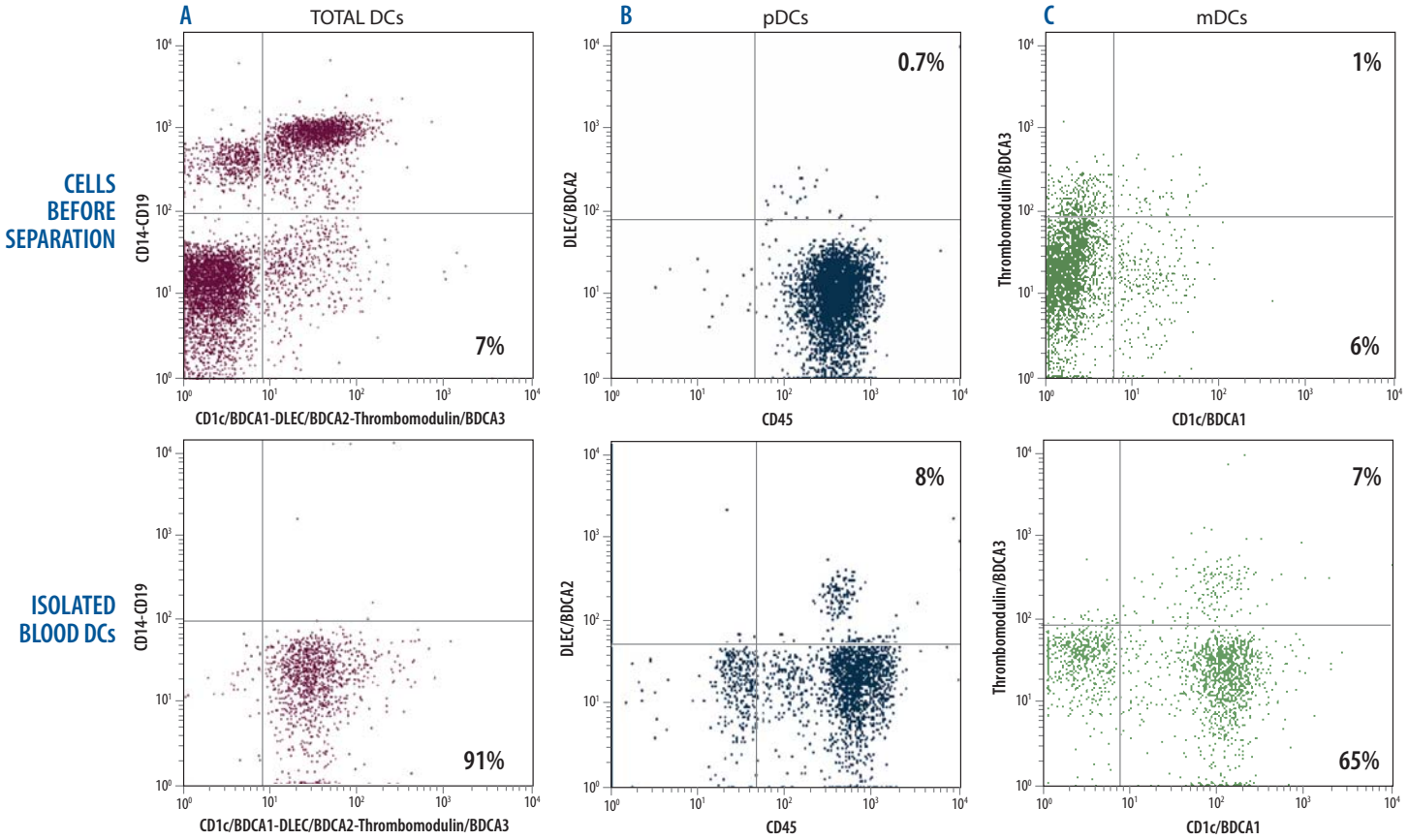
Products for Dendritic Cell Research

Dendritic cells (DCs) are bone marrow-derived leukocytes that link the innate and adaptive immune responses. These specialized cells have the ability to capture, process, and present antigens to naïve T cells to promote their differentiation and activation. While all DCs are capable of antigen presentation, DCs are not a homogeneous population of cells. Several DC subtypes have been characterized that differ in their locations, phenotypes, and immunological functions. This plasticity allows DCs to differentially shape the immune response when presented with diverse pathogens.

Mouse DCs can be divided into three distinct subtypes: plasmacytoid, conventional, and interferon-producing killer DCs (IKDCs). Plasmacytoid DCs (pDCs) are found in the blood, thymus, bone marrow, liver, and lymphoid organs, and are primarily responsible for pathogen surveillance. pDCs produce large quantities of type I interferons following exposure to viruses, bacteria, and certain toll-like receptor agonists. They can be distinguished from other DCs based on their expression of CD45RA and B220. Conventional DCs (cDCs) can be subdivided into migratory and lymphoid tissue-resident DCs. Migratory cDCs include Langerhans cells and interstitial DCs such as dermal DCs. Lymphoid tissue-resident cDCs can be further subdivided into $CD4^-CD8^+$, $CD4^+CD8^-$, and $CD4^-CD8^-$ subtypes in mice. $CD8^+$ and $CD8^-$ DCs differ in their cytokine production and antigen presentation on MHC class I molecules. IKDCs are the final subtype of mouse DCs that have been characterized. These cells express markers of both DCs and natural killer cells. Although human DC subsets have not been as clearly defined, recent studies suggest a similar subset segregation due to the heterogeneous expression of several markers on human blood DCs. This includes CD1c/BDCA1 and Thrombomodulin/BDCA3 on myeloid DCs, and DLEC/BDCA2 on plasmacytoid DCs. R&D Systems offers a wide range of research reagents for dendritic cell research.

MagCellect™ Human Blood Dendritic Cell Isolation Kit Catalog # MAGH110

R&D Systems MagCellect Human Blood Dendritic Cell Isolation Kit is designed to enrich for total dendritic cells (DCs) obtained from human blood using a two-step negative selection protocol that removes unwanted cells from a mononuclear cell suspension. Unlike positive selection kits, the MagCellect Kit leaves the isolated DC population untouched. The typical purity of the recovered DCs (defined as $BDCA1^+$-$BDCA2^+$-$BDCA3^+$) ranges between 75-92%.



Enrichment of Dendritic Cells from Human Blood using the MagCellect Human Blood Dendritic Cell Isolation Kit. The MagCellect Human Blood Dendritic Cell Isolation Kit (Catalog # MAGH110) was used to isolate dendritic cells from human blood. (**A**) Total dendritic cells, before (top) and after (bottom) enrichment, were detected using anti-CD14, anti-CD19, anti-CD1c/BDCA1, anti-DLEC/BDCA2, and anti-Thrombomodulin/BDCA3 antibodies. CD14 and CD19 are markers of monocytes and B cells. (**B**) Plasmacytoid dendritic cells, before (top) and after (bottom) enrichment, were detected using anti-DLEC/BDCA2 and anti-CD45 antibodies. (**C**) $BDCA1^+$ or $BDCA1^+$-$BDCA3^+$ myeloid dendritic cells, before (top) and after (bottom) enrichment, were detected using anti-Thrombomodulin/BDCA3 and anti-CD1c/BDCA1 antibodies.

Products for Dendritic Cell Lineage Research

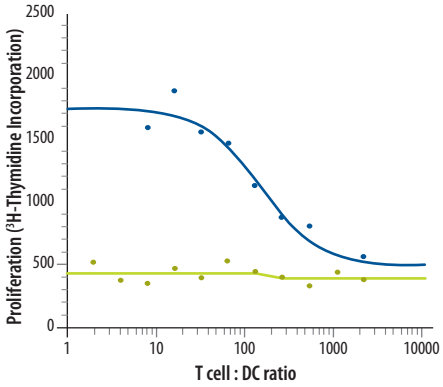
Dendritic Cell Lineage Markers			
Molecules	Proteins	Antibodies	ELISAs; Cell Selection Kits
B7-1/CD80	H M R	H M R	H M
B7-2/CD86	H M R	H M R	R
B7-H1/PD-L1	H M	H M	
B220/CD45R		M	
CCR7		H M	
CCR9		H M	
CD1c/BDCA1		H	
CD3		M	H M R
CD3ε		H M	
CD4	H	H M Ca F	M; H M R
CD8		H M F	H; H M R
CD24		H	
CD27 Ligand/TNFSF7	M	H M	M
CD40/TNFRSF5	H M	H M	M
CD43		H	
CD45	H	H M	H; H
CD83	H M	H M	
CD83, a.a. 20-143		H	
CX3CR1		H M	
DC-LAMP		H	
DC-SIGN/CD209	H	H	
DC-SIGN + DC-SIGNR		H	
DEC205/CD205		H M	

Dendritic Cell Lineage Markers			
Molecules	Proteins	Antibodies	ELISAs; Cell Selection Kits
DLEC/CLEC4C/BDCA2	H	H	
EMR1		M	
Fcγ RIII/CD16	H M	H M	
Flt-3/Flk-2	H M	H M	H
Gr-1/Ly-6G		M	
HLA-DR		H	
IL-3 Rα/CD123	H M	H M	
Integrin αE/CD103		M	
Integrin αM/CD11b		H M	
Integrin αV/CD51		H	H
Integrin αX/CD11c		H M	
Integrin αXβ2	H		
Langerin/CD207	H	H	
M-CSF R	H M	H M	H
NCAM-1/CD56	H	H	H; H
Neuropilin-1/BDCA4	H R	H M R	
PD-L2/CD273	H M	H M	
Sca-1/Ly6		M	M
SCF R/c-kit	H	H M	H
L-Selectin/CD62L	H M R	H M R	H M R
Thrombomodulin/ BDCA3	H M	H M	H
TSLP R	H M	H M	

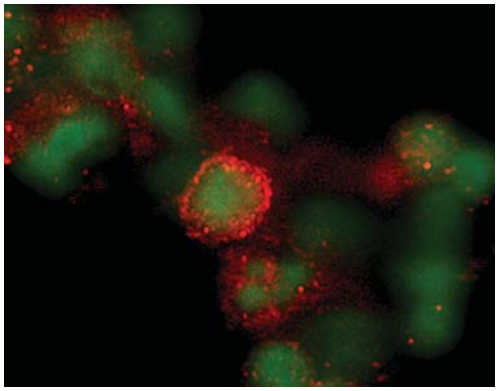
Key: **H** Human **M** Mouse **R** Rat **Ca** Canine **F** Feline

Product	Description	Catalog #
Human StemXVivo Serum-free Dendritic Cell Base Media*	Media that is specially formulated and optimized for the culture and differentiation of human dendritic cells.	CCM003

**Media must be supplemented with cytokines/growth factors for the desired cell culture application. The combination of these factors depends on the experimental design of the researcher. A protocol describing the generation of monocyte-derived dendritic cells from CD14⁺ monocytes is available on our website at www.RnDSystems.com/go/exvivoDCProtocol*



Dendritic cell-induced Proliferation of Allogeneic T Cells following Isolation using the MagCellect Human Blood DC Isolation Kit. Dendritic cells were isolated from human blood using the MagCellect Human Blood Dendritic Cell Isolation Kit (Catalog # MAGH110). The ability of these cells to stimulate the proliferation of allogeneic T cells was assessed using the mixed leukocyte reaction assay. T cells were cultured either alone (green line) or with serial dilutions of dendritic cells starting at a T cell:DC ratio of 8:1 (blue line). T cell proliferation was measured after 3 days by ^{3}H-thymidine incorporation.



Detection of CCR7 in Human Peripheral Blood Mononuclear Cells (PBMCs). CCR7 was detected in human PBMCs using anti-human CCR7 monoclonal antibody (Catalog # MAB197; red). Cells were counterstained (green).

For more information visit our website at www.RnDSystems.com/go/DendriticCells

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