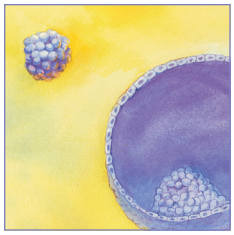
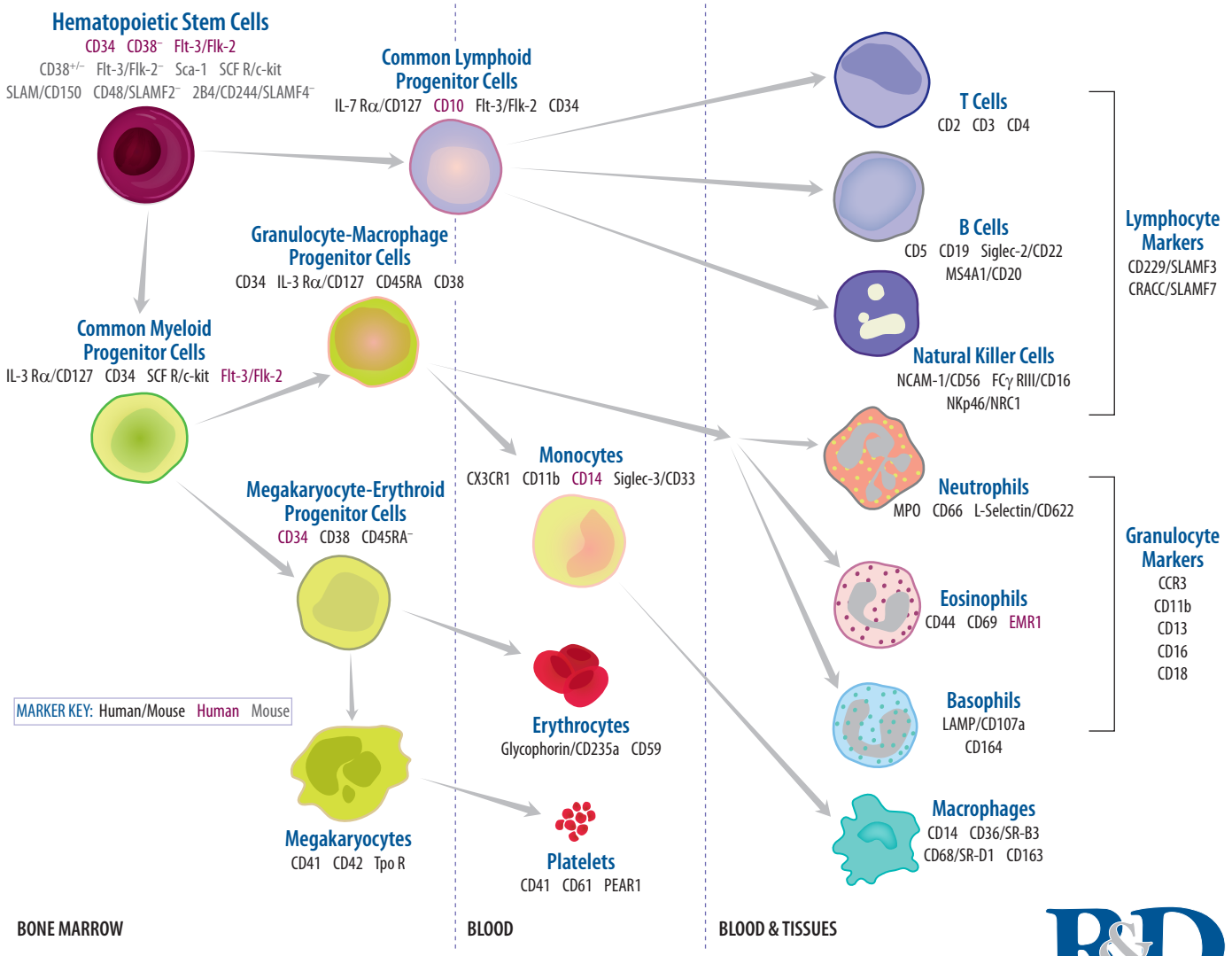


STEM CELL FOCUS: HEMATOPOIETIC STEM CELLS

Hematopoietic Stem Cell & Lineage-specific Markers

FEATURED DATA: CD14 · CD69 · CXCL12/SDF-1α · CXCR4 · IL-3 Rα · IL-7 Rα/CD127 · LAMP1/CD107a · MPO · MS4A1/CD20 · SCF R/c-kit

Hematopoietic stem cells (HSCs) are multipotent, self-renewing progenitor cells from which all differentiated blood cell types arise during the process of hematopoiesis. These cells include lymphocytes, granulocytes, and macrophages of the immune system as well as circulating erythrocytes and platelets. Classically, HSCs are thought to differentiate into two lineage-restricted, lymphoid and myelo-erythroid, oligopotent progenitor cells. An alternative, "myeloid-based" model for blood lineage development from HSCs describes a novel intermediary, a common myelo-lymphoid progenitor cell, which has the capacity to generate progeny from both lineages. The mechanisms controlling HSC homing to the bone marrow, self-renewal, and differentiation are thought to be influenced by a diverse set of cytokines, chemokines, receptors, and intracellular signaling molecules. For a complete listing of tools for HSC identification, expansion, differentiation, and verification, please visit: **www.RnDSystems.com/HSC**.



Hematopoietic Stem Cell Lineage-specific Markers. The illustration depicts a model of the hierarchy of hematopoietic stem cell differentiation and presents early lineage-committed and cell-specific markers that can be used to differentiate between immune cell types. For additional markers of fully differentiated cell types, including T cell family members and dendritic cells, please visit: **www.RnDSystems.com/ImmuneCells**.

Hematopoietic Stem Cell & Lineage-specific Markers

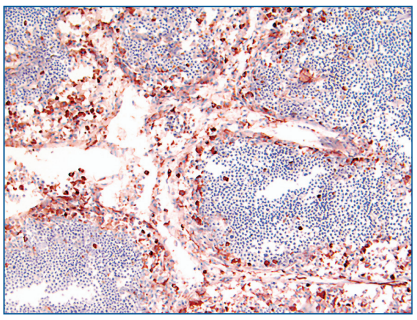
Hematopoietic Stem Cells (HSCs) and their differentiated progeny can be identified by the expression of specific cell surface lineage markers such as Cluster of Differentiation (CD) proteins and cytokine receptors. The product tables on pages 2 & 3 highlight a subset of molecules to detect key cell surface markers associated with HSCs and early lineage-committed cells of the immune system.

For a complete listing of available products to study HSCs and fully differentiated cells of the immune system, including additional cell surface markers, please visit: **www.RnDSystems.com/HSC**.

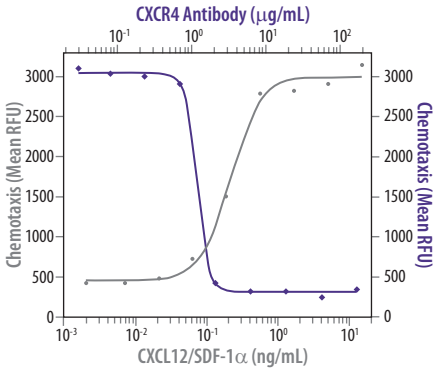
MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs CELL SELECTION & DETECTION KITS & REAGENTS
HEMATOPOIETIC STEM CELL MARKERS			
2B4/CD244/SLAMF4	H M	H (FA, FC, IHC, WB) M (FC, IHC, WB)	H
ABCG2		H (FC, IHC)	
C1q R1/CD93		H (FC, IHC, WB) M (FC, IHC, WB)	
CD34		H (FC, IHC) M (FC, WB) R (FC, IHC, WB) P (WB) Ca (FC, WB)	
CD38	H M	H (FC, IHC, IP, WB) M (FC, WB)	
CD45	H M	H (FC, IHC) M (FA, FC, IHC, IP, WB)	H H
CD48/SLAMF2	H M	H (FC, IHC, WB) M (ELISA, FC, IHC, WB)	M
CDCP1		H (FC, IHC, IP, WB) M (FC, IHC, WB)	
CXCR4		H (B/N, FC, IHC) M (B/N, FC, IHC) F (FC, IHC)	H
Flt-3/Flk-2	H M	H (FC, IHC, WB) M (FC, IHC, WB)	H
SCF R/c-kit	H	H (B/N, ELISA, FC, IHC, WB) M (FC, IHC, WB)	H
SLAM/CD150	M	H (FC, WB) M (ELISA, FC, WB)	H M
LINEAGE-SPECIFIC MARKERS			
Common Lymphoid Progenitor Cells			
CD34		H (FC, IHC) M (FC, WB) R (FC, IHC, WB) P (WB) Ca (FC, WB)	
Flt-3/Flk-2	H M	H (FC, IHC, WB) M (FC, IHC, WB)	H
IL-7 Rα/CD127	H M R	H (FC, WB) M (ELISA, FC, WB) R (FC, WB)	M
Neprilysin/CD10	H M	H (ELISA, FC, IHC, IP, WB) M (B/N, ELISA, IHC, IP, WB)	H M
B Cells			
B220/CD45R		M (CD, FC, IHC, IP)	
CD5		H (FA, FC, IHC, WB) M (CD, FA, FC, IHC, IP)	
CD19		H (FC)	

MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs CELL SELECTION & DETECTION KITS & REAGENTS
MS4A1/CD20		H (FC)	
Siglec-2/CD22	H M	H (FC, IHC, WB) M (B/N, FC, IHC, WB)	
Natural Killer Cells			
CD8α		H (FC, IHC) M (CD, FA, FC, IHC, IP) Ca (IHC) CR (FC) F (IHC, WB)	H M R
Fcγ RIIIA/B (CD16)	M	H (FC) M (B/N, ELISA, FC, IHC, WB)	
KIR2DL4/CD158d	H	H (FA, FC)	
NCAM-1/CD56	H M	H (ELISA, FC, IHC, WB) M (WB) R (WB)	H H
NKp46/NCR1	H M	H (FA, FC, IHC, WB) M (FA, FC, WB)	
T Cells			
CD2		H (FC, IHC, WB) M (FC, WB)	
CD3		H (FA, FC, IHC, IP) M (CD, FA, FC, IHC, IP)	H M R
CD4	H R CR F	H (B/N, FC, IHC, WB) M (CD, FA, FC, IHC, IP, WB) R (FC, WB) Ca (FC, IHC, WB) CR (FC) F (FC, IHC, WB)	H M R
Common Myeloid Progenitor Cells			
CD34		H (FC, IHC) M (FC, WB) R (FC, IHC, WB) P (WB) Ca (FC, WB)	
Flt-3/Flk-2	H M	H (FC, IHC, WB) M (FC, IHC, WB)	H
IL-3 Rα	H M	H (B/N, FC, IHC, WB) M (FC, WB)	
SCF R/c-kit	H	H (B/N, ELISA, FC, IHC, WB) M (FC, IHC, WB)	H
Granulocyte-Macrophage Progenitor Cells			
CD34		H (FC, IHC) M (FC, WB) R (FC, IHC, WB) P (WB) Ca (FC, WB)	
CD38	H M	H (FC, IHC, IP, WB) M (FC, WB)	
IL-3 Rα	H M	H (B/N, FC, IHC, WB) M (FC, WB)	

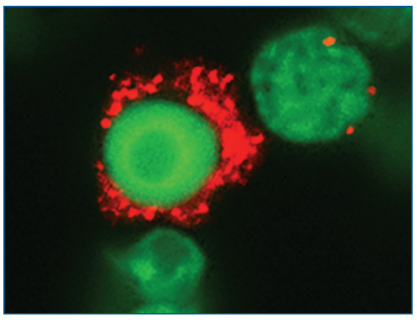
Species Key: H Human M Mouse R Rat Ca Canine CR Cotton Rat F Feline P Porcine
Application Key: **B/N** Blocking/Neutralization **CD** Cell Depletion **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **FC** Flow Cytometry **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot



CD14 in Human Lymph Node. Cluster of Differentiation 14 (CD14) was detected in immersion-fixed paraffin-embedded sections of human lymph node using a Biotinylated Sheep Anti-Human CD14 Antigen Affinity-purified Polyclonal Antibody (Catalog # BAF383). The tissue was stained using the Anti-Sheep HRP-AEC Cell & Tissue Staining Kit (Catalog # CTS020; red) and counterstained with hematoxylin (blue). Specific staining was confined to sinusoidal histiocytes in the lymph node.



Chemotaxis Induced by CXCL12/SDF-1α and Neutralized by a CXCR4 Antibody. Recombinant Human/Feline/Rhesus Macaque CXCL12/SDF-1α (Catalog # 350-NS) chemoattracts the BaF3 mouse pro-B cell line expressing human CXCR4 in a concentration-dependent manner (gray line). Cells that migrated through to the lower chemotaxis chamber were measured using Resazurin (Catalog # AR002). Chemotaxis elicited by 1 ng/mL Recombinant Human/Feline/Rhesus Macaque CXCL12/SDF-1α is neutralized (purple line) by increasing concentrations of a Mouse Anti-Human CXCR4 Monoclonal Antibody (Catalog # MAB173).

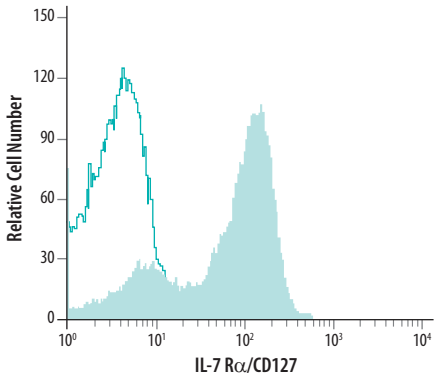


IL-3 Rα in Human Peripheral Blood Lymphocytes. Interleukin 3 Receptor α (IL-3 Rα) was detected in immersion-fixed human peripheral blood lymphocytes using a Mouse Anti-Human IL-3 Rα Monoclonal Antibody (Catalog # MAB301). The cells were stained with a fluorochrome-conjugated secondary antibody (red) and the nuclei were counterstained (green). Specific staining was localized to the cytoplasm.

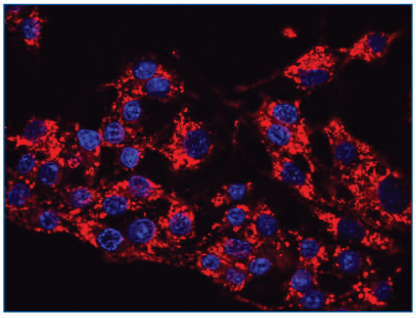
MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs CELL SELECTION & DETECTION KITS & REAGENTS
Granulocytes			
Aminopeptidase N/ ANPEP	H M	H (FC, IHC, IP, WB) M (FC, IHC, IP, WB)	
CCR3		H (B/N, FC, IHC) M (FC) R (FC)	
Fcγ RIIIA/B (CD16)	M	H (FC) M (B/N, ELISA, FC, IHC, WB)	
Integrin αM/CD11b		H (FC, IHC, WB) M (CD, FC, IHC, IP)	
Integrin β2/CD18	H	H (B/N, FC, IHC, WB) M (FA, FC, WB)	
Basophils			
CD164		H (FC, WB) M (WB)	
LAMP1/CD107a	H M	H (FC, IHC, WB) M (FC, IHC, WB)	
Eosinophils			
CD44	H M R P	H (FC, IHC, IP, WB) M (B/N, FC, IHC, WB) R (B/N, FC, IHC, WB) Ca (FC)	H
CD69		H (FC, IHC, WB) M (FC, IHC, WB)	
F4/80/EMR1		M (FC, IHC)	
Neutrophils			
Myeloperoxidase/ MPO	H M	H (IHC, WB) M (IHC, WB)	H
L-Selectin/CD62L	H M R	H (B/N, ELISA, FC, WB) M (ELISA, FC, WB) R (ELISA, IHC, WB)	H M R
Monocytes			
CCR2		H (FC) M (FC)	
CD14	H M	H (B/N, ELISA, FC, IHC, WB) M (FC, WB) P (FC, WB)	H H
CX3CR1		H (FC, WB) M (FC, WB)	
Fcγ RIIIA/B (CD16)	M	H (FC) M (B/N, ELISA, FC, IHC, WB)	
Gr-1/Ly-6G		M (CD, FC, IHC, IP)	
Integrin αM/CD11b		H (FC, IHC, WB) M (CD, FC, IHC, IP)	
Siglec-3/CD33	H	H (FC, WB) M (WB)	

MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs CELL SELECTION & DETECTION KITS & REAGENTS
Macrophages			
CD14	H M	H (B/N, ELISA, FC, IHC, WB) M (FC, WB) P (FC, WB)	H H
CD36/SR-B3	H M	H (FC, WB) M (ELISA, FC, IHC, WB)	M
CD68/SR-D1		H (FC, IHC, WB)	
CD163	H	H (ELISA, FC, WB)	H
MMR/CD206	H M	H (FC, IHC, WB) M (FC, WB)	
SIGNR1/CD209b	M	M (B/N, FC, WB)	
Megakaryocyte-Erythroid Progenitor Cells			
CD34		H (FC, IHC) M (FC, WB) R (FC, IHC, WB) P (WB) Ca (FC, WB)	
CD38	H M	H (FC, IHC, IP, WB) M (FC, WB)	
Megakaryocytes			
Glycoprotein V/ CD42d	H M	H (FC, WB)	
Integrin α2b/CD41		M (FC, IHC, WB)	
Thrombopoietin R/ Tpo R	H M	H (B/N, FC, WB) M (WB)	
Platelets			
Integrin α2b/CD41		M (FC, IHC, WB)	
Integrin β3/CD61		H (B/N, FC, IHC, IP, WB)	
PEAR1	H	H (FC, WB)	
Erythrocytes			
CD59		H (IHC, WB)	
Erythropoietin R	H M	H (ELISA, FC, IP, WB) M (IHC, WB)	H
Glycophorin A		H (FC, IHC, IP)	

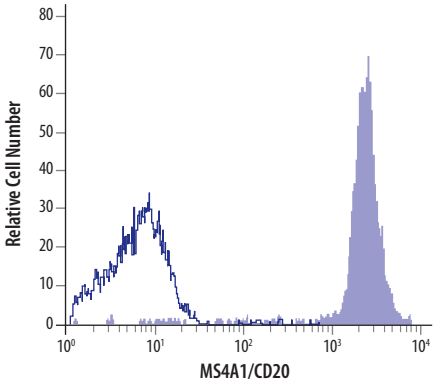
Species Key: H Human M Mouse R Rat Ca Canine CR Cotton Rat F Feline P Porcine
Application Key: **B/N** Blocking/Neutralization **CD** Cell Depletion **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **FC** Flow Cytometry **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot



Detection of IL-7 Rα by Flow Cytometry. Human peripheral blood lymphocytes were stained with an APC-conjugated Mouse Anti-Human IL-7 Rα/CD127 Monoclonal Antibody (Catalog # FAB306A; filled histogram) or an APC-conjugated Mouse IgG_1 Isotype Control (Catalog # IC002A; open histogram).



LAMP1/CD107a in the RAW 264.7 Mouse Cell Line. Lysosome-associated membrane protein1 (LAMP1/CD107a) was detected in immersion-fixed RAW 264.7 mouse monocyte/macrophage cells using a Goat Anti- Mouse LAMP1/CD107a Lumenal Domain Antigen Affinity-purified Polyclonal Antibody (Catalog # AF4320). Cells were stained using the NorthernLights™ 557-conjugated Donkey Anti-Goat IgG Secondary Antibody (Catalog # NL001; red) and the nuclei were counterstained with DAPI (blue). Specific staining was localized to the cytoplasm.



Detection of MS4A1/CD20 by Flow Cytometry. Human B cells were stained with a Fluorescein-conjugated Mouse Anti-Human MS4A1/CD20 Monoclonal Antibody (Catalog # FAB4225F; filled histogram) or a Fluorescein-conjugated Mouse IgG_1 Isotype Control (Catalog # IC002F; open histogram).

Hematopoietic Stem Cell Growth Factors

Hematopoiesis is regulated, in part, by extrinsic signaling molecules including colony-stimulating factors (CSFs) and interleukins (ILs) that activate intracellular signaling molecules such as kinases. The product tables on pages 4 & 5 represent a subset of factors that are known to influence Hematopoietic Stem Cell (HSC) pluripotency, proliferation, and lineage commitment.

For a complete listing of growth factors associated with HSC self-renewal and differentiation, please visit: **www.RnDSystems.com/HSC**.

MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs
Akt		H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	H M R
Akt1	H	H (FC, IHC, WB) M (WB) R (WB)	H M R
Akt2		H (FC, IHC, WB) M (IHC, WB) R (IHC, WB)	H
Akt3		H (FC, WB)	
Bad		H (IHC, WB) M (WB)	H
Bcl-2	H	H (B/N, IHC, IP, WB) M (IHC, IP, WB) R (IHC, IP, WB)	H
Cardiotrophin-1/CT-1	H M	H (B/N, WB) M (B/N, ELISA, WB)	M
CLC	H	H (WB)	
CLC/CNTF Rα Chimera	H		
CLF-1	H		
CLF-1/CLC Complex	H		
CNTF	H R	H (B/N, ELISA, WB) R (B/N, ELISA, IHC, WB)	H R
CNTF Rα	H R	H (B/N, WB) R (B/N, IHC, WB)	
Common γ Chain/ IL-2 Rγ	H M	H (B/N, FC, WB) M (B/N, FC, WB)	
CXCL12	H M	H M F Pr	H M
ERK1	H	H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	H M R
ERK1/ERK2		H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	H M R
ERK2	H	H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	H M R
Erythropoietin	H M R Ca	H (AP, B/N, IHC, WB) M (B/N, WB) R (B/N, WB)	H M
Erythropoietin R	H M	H (FC, IP, WB) M (IHC, WB)	H
Flt-3 Ligand	H M F	H (B/N, ELISA, WB) M (B/N, ELISA, WB) F (B/N, IHC, WB)	H M
Flt-3/Flk-2	H M	H (FC, IHC, WB) M (FC, IHC, WB)	H
G-CSF	H M	H (B/N, ELISA, FC, WB) M (B/N, ELISA, WB)	H M
G-CSF R/CD114	H M	H (ELISA, FC, WB) M (B/N, FC, WB)	H
GM-CSF	H M R Ca F P	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, WB) R (B/N, ELISA, FC, IHC, WB) P (B/N, WB) Ca (B/N, ELISA, IHC, WB) F (B/N, ELISA, WB)	H M R Ca F
GM-CSF Rα	H M	H (FC, WB) M (B/N, FC, IHC)	
gp130	H M R	H (B/N, ELISA, FC, WB) M (B/N, ELISA, FC, IHC, WB) R (WB)	H M
GRB2		H (IHC, WB) M (IHC, WB) R (IHC, WB)	
GSK-3α		H (IHC, WB) M (IHC, WB) R (IHC, WB)	H
GSK-3α/β		H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	H M R
GSK-3β	H	H (FC, IHC, WB) M (FC, WB) R (FC, WB)	H M R
IL-2	H M R B Ca CR E F P Rb	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, WB) R (B/N, ELISA, IHC, WB) B (ELISA, IHC, WB) Ca (B/N, ELISA, IHC, WB) CR (B/N, WB) E (ELISA, IHC, WB) F (B/N, ELISA, IHC, WB) P (B/N, FC, IHC, WB)	H M R B Ca E F
IL-2 Rα	H M R Ca	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, IHC, WB) R (FC, IHC, WB) Ca (FC)	H M
IL-2 Rβ	H	H (B/N, FC, IHC, WB) M (FC, WB)	
IL-21	M Ca Rb	M (B/N, ELISA, FC, IHC, WB) Ca (B/N)	M

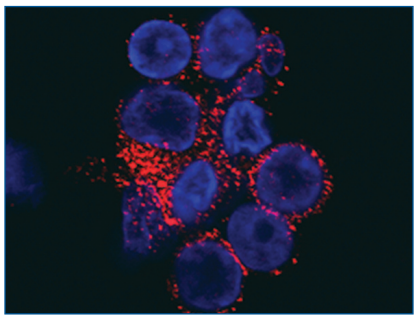
MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs
IL-21 R	H M R	H (FC, WB) M (FC, IHC, WB)	
IL-3	H M R	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, WB) R (B/N, IHC, WB) Ca (IHC)	H M
IL-3 Rα	H M	H (B/N, FC, IHC, WB) M (FC, WB)	
IL-3 Rβ	M	M (B/N, ELISA, FC, WB)	M
IL-31	H M	H (B/N, ELISA, IHC, WB) M (WB)	H
IL-31 RA	H	H (FC, IHC, WB) M (WB)	
IL-4	H M R B Ca CR E F P Rb RM	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, WB) R (B/N, ELISA, IHC, WB) P (B/N, ELISA, FC, IHC, WB) B (IHC, WB) Ca (B/N, WB) CR (B/N, ELISA, WB) E (ELISA, IHC, WB) F (B/N, ELISA, WB)	H M R P CR E F
IL-4 Rα	H M	H (B/N, FC, IHC, WB) M (FC, WB)	
IL-5	H M R B Ca E F P RM	H (B/N, ELISA, FA, FC, IHC, WB) M (B/N, ELISA, FC, IHC, WB) R (B/N, IHC, WB) P (B/N, IHC, WB) B (WB) Ca (B/N, IHC, WB) E (B/N, IHC, WB) F (B/N, ELISA, IHC, WB)	H M F
IL-5 Rα/CD125	H M	H (B/N, FC, WB) M (WB)	
IL-6	H M R Ca CR E F P	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, IHC, WB) R (B/N, ELISA, IHC, WB) Ca (B/N, ELISA, FC, IHC, WB) CR (B/N, WB) E (B/N, IHC, WB) F (B/N, IHC, WB) P (B/N, ELISA, FC, IHC, WB)	H M R P Ca CR F
IL-6 Rα	H M	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, IHC, WB)	H M
IL-7	H M	H (B/N, ELISA, IHC, WB) M (B/N, ELISA, WB)	H M
IL-7 Rα/CD127	H M R	H (FC, WB) M (ELISA, FC, WB) R (FC, WB)	M
IL-9	H M R	H (B/N, FC, WB) M (B/N, FC, WB) R (B/N, FC, WB)	
IL-9 R	H R	H (B/N, FC, WB) M (WB) R (WB)	
IL-11	H M	H (B/N, ELISA, FC, WB) M (B/N, ELISA, WB)	H M
IL-11 Rα	H M	H (WB) M (B/N, WB)	
IL-15	H M	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, IHC, WB)	H M
IL-15 Rα	H M	H (B/N, FC, IHC, WB) M (B/N, FC, WB)	M
IRS1		H (IHC, WB) M (IHC, WB) R (IHC, WB)	
IRS2		H (WB)	
Jak1		H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	
Jak1		H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	
Jak2		M (WB) R (WB)	
Jak3		H (FC, WB)	
Jak3		H (FC, WB)	
Leptin R	H M	H (FC, IHC, WB) M (ELISA, FC, IHC, WB)	H M
Leptin/OB	H M R	H (B/N, ELISA, IHC, WB) M (B/N, ELISA, IHC, WB)	H M
LIF		H (B/N, ELISA, FC, IHC, WB) M (B/N, IHC, WB)	H M
LIF Rα	H M	H (B/N, FC, WB) M (FC)	
Mcl-1	H	H (IHC, WB)	
M-CSF	H M	H (B/N, ELISA, FC, WB) M (B/N, ELISA, WB) R (WB)	H M
M-CSF R	H M	H (B/N, ELISA, FC, IHC, WB) M (FC, IHC, WB)	H

Species Key: H Human M Mouse R Rat B Bovine Ca Canine Ch Chicken CR Cotton Rat E Equine F Feline Ms Multispecies P Porcine Pr Primate Rb Rabbit X *Xenopus* Z Zebrafish
Application Key: **B/N** Blocking/Neutralization **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **FC** Flow Cytometry **IF** Immunofluorescence **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot

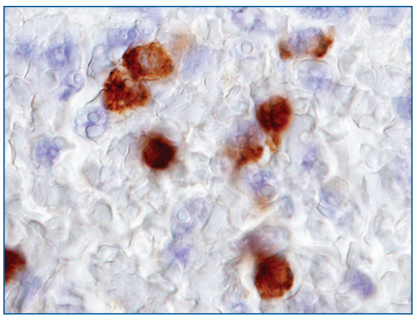
MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs
MEK1		H (IHC, WB) M (IHC, WB) R (IHC, WB) B (WB) Ca (WB) Ch (WB) Pr (WB) X (WB)	
MEK1/MEK2		H (IHC, WB) M (IHC, WB) R (IHC, WB)	H M R
MEK2	H	H (IHC, WB) M (IHC, WB) R (IHC, WB)	
Neuropilin-1	H M R	H (B/N, FC, IHC, WB) M (B/N, FC, IHC, WB) R (B/N, FC, IHC, WB)	
Neuropilin-2	H R	H (B/N, FC, IHC, WB) R (B/N, FC, WB)	
Neuropoietin/NP	M	M (WB)	
Oncostatin M/OSM	H M	H (B/N, ELISA, FC, WB) M (B/N, IHC, WB)	H
OSM Rβ	H M	H (FC, IHC, WB) M (FC, IHC, WB)	
p70 S6 Kinase	H	H (FC, IHC, WB) M (FC, IHC, WB) R (FC, IHC, WB)	H M R
PDGF	H P	H (B/N, WB) Ms (B/N, WB)	
PDGF Rα	H M	H (B/N, FC, IHC, IP, WB) M (B/N, IHC, WB)	H M
PDGF Rβ	H M	H (B/N, FC, IHC, IP, WB) M (IHC, WB)	H M
PDGF-A		H (ELISA, WB)	
PDGF-AA	H R	H (B/N, ELISA, IHC, WB) R (B/N, IHC, WB) Ms (B/N, WB)	H M
PDGF-AB	H R	H (B/N, ELISA, IHC, WB) Ms (B/N, WB)	H M R
PDGF-B		H (B/N, ELISA, WB) Ms (B/N, WB)	
PDGF-BB	H R	H (B/N, ELISA, WB)	H M R
PDGF-C		H (B/N, IHC, WB) M (B/N, IHC, WB)	
PDGF-CC	H M		
PDGF-D		H (B/N, IHC, WB)	
PDGF-DD	H		H
PDK-1	H	H (WB) M (WB) R (WB)	
PI 3-Kinase p110β		H (WB)	
PI 3-Kinase p110γ		H (WB)	
PI 3-Kinase p110δ		H (WB)	
PI 3-Kinase p55γ		H (WB) M (WB) R (WB)	
PI 3-Kinase p85α		H (WB) M (WB) R (WB)	

MOLECULE	RECOMBINANT & NATURAL PROTEINS	ANTIBODIES	ELISAs
PlGF	H	H (ELISA, IHC, WB)	H
PlGF-2	H M	M (B/N, ELISA, WB)	M
Raf-1	H	H (IHC, WB) M (IHC, WB) R (IHC, WB) B (WB) Ca (WB) Ch (WB) Pr (WB)	
Ras		H (WB) M (WB) R (WB)	
SCF R/c-kit	H	H (B/N, ELISA, FC, IHC, WB) M (FC, IHC, WB)	H
SCF/c-kit Ligand	H M R Ca F	H (B/N, ELISA, WB) M (B/N, ELISA, WB) R (WB) Ca (B/N, ELISA, IHC, WB) F (IHC, WB)	H M Ca F
SOS2		H (WB)	
STAT1		H (FC, IHC, IP, WB) M (FC, IP, WB)	H M
STAT1		H (FC, IHC, IP, WB) M (FC, IP, WB)	H M
STAT3		H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M
STAT3		H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M
STAT5a		H (FC, IHC, IP, WB) M (IHC, IP, WB)	
STAT5b		H (FC, IP, WB) M (FC, IP, WB)	
STAT6		H (FC, IHC, IP, WB) M (FC, IP, WB) R (FC, WB)	H M
Thrombopoietin R/ Tpo R	H M	H (B/N, FC, WB) M (WB)	
Thrombopoietin/Tpo	H M	H (B/N, WB) M (B/N, WB)	HM
VEGF	H M R Ca F Z	H (B/N, ELISA, FC, IF, IHC, WB) M (B/N, ELISA, IHC, WB) R (B/N, ELISA, IHC, WB) Ca (B/N, ELISA, IHC, WB) Z (B/N, WB)	H M R Ca
VEGF R1, R2, R3		H (FC)	
VEGF R1/Flt-1	H M	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, IHC, WB)	H M
VEGF R2/KDR/Flk-1	H M	H (B/N, ELISA, FC, IHC, WB) M (B/N, ELISA, FC, IHC, WB)	H M
VEGF R3/Flt-4	H M	H (ELISA, FC, IHC, WB) M (ELISA, FC, WB)	H M
VEGF/PlGF Heterodimer	H	H (WB)	H
VEGF-B	H M	H (IHC, WB) M (B/N, IHC, WB)	
VEGF-C	H	H (IHC, WB) M (WB) R (WB)	H
VEGF-D	H M	H (B/N, ELISA, IHC, WB) M (ELISA, IHC, WB)	H M

Species Key: H Human M Mouse R Rat B Bovine Ca Canine Ch Chicken CR Cotton Rat E Equine F Feline Ms Multispecies P Porcine Pr Primate Rb Rabbit X *Xenopus* Z Zebrafish
Application Key: **B/N** Blocking/Neutralization **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **FC** Flow Cytometry **IF** Immunofluorescence **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot



CD69 in Human Peripheral Blood Lymphocytes. Cluster of Differentiation 69 (CD69) was detected in immersion-fixed human peripheral blood mononuclear cells (PBMCs) stimulated with ionomycin and PMA using a Mouse Anti-Human CD69 Monoclonal Antibody (Catalog # MAB23591). Cells were stained using the NorthernLights 557-conjugated Donkey Anti-Mouse IgG Secondary Antibody (Catalog # NL007; red) and the nuclei were counterstained with DAPI (blue). Specific staining was localized to the plasma membrane and cytoplasm.



MPO in Human Spleen. Myeloperoxidase (MPO) was detected in immersion-fixed paraffin-embedded sections of human spleen using a Mouse Anti-Human/Mouse MPO Monoclonal Antibody (Catalog # MAB3174). Before incubation with the primary antibody, the tissue was subjected to heat-induced epitope retrieval using Antigen Retrieval Reagent-Basic (Catalog # CTS013). The tissue was stained using the Anti-Mouse HRP-DAB Cell & Tissue Staining Kit (Catalog # CTS002; brown) and counterstained with hematoxylin (blue). Specific MPO staining is confined to the cytoplasm of splenocytes.

Serum Free Media for Cells of Hematopoietic Lineages

The StemXVivo™ Serum-Free Dendritic Cell Base Media and T Cell Base Media are specifically formulated and optimized for the culture and differentiation of human dendritic cells and T cells, respectively. Both products must be supplemented with cytokines/growth factors for the desired cell culture application. The cytokine/growth factor combinations used depend upon the experimental design of each researcher.

PRODUCT	DESCRIPTION	CATALOG #	SIZE
Human StemXVivo Serum-free Dendritic Cell Base Media	Base Media formulated and optimized for the culture and differentiation of human dendritic cells	CCM003	250 mL
Human StemXVivo Serum-free T Cell Base Media	Base Media formulated and optimized for the culture and differentiation of human T lymphocytes	CCM010	250 mL

Supplements for Hematopoietic Stem Cell Expansion

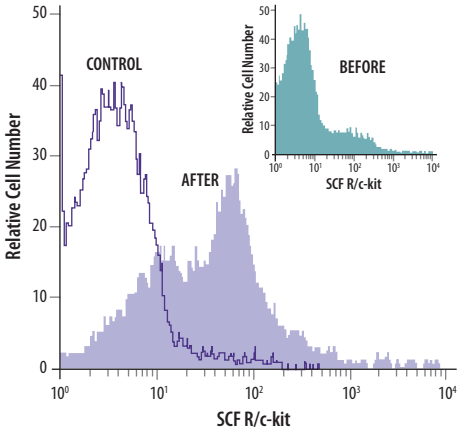
Contains a combination of growth factors that support the *ex vivo* expansion of hematopoietic stem cells.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Mouse Hematopoietic Stem Cell Expansion Cytokine Panel	100 µg each of Recombinant Mouse Flt-3 Ligand, Tpo, and SCF	SMPK9	1 Kit

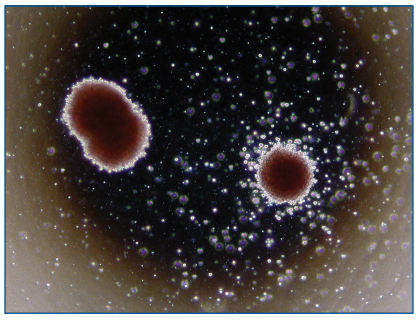
Mouse Hematopoietic Lineage Depletion Antibodies

Anti-mouse monoclonal antibodies can be used to efficiently bind lineage-committed bone marrow-derived cells, where they can be used in conjunction with magnetic particle separation systems or flow cytometric cell sorting for the enrichment of uncommitted mesenchymal or hematopoietic stem cells. Antibodies included in the lineage depletion panel are optimized to bind 1 x 10^9 bone marrow-derived cells.

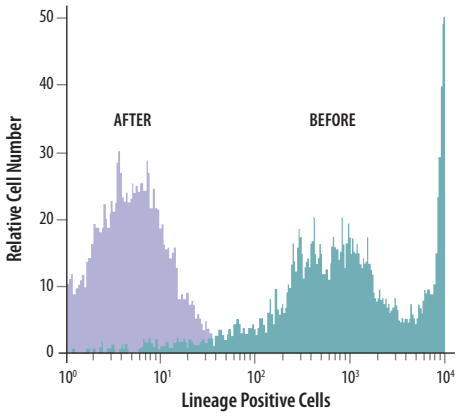
PRODUCT	DESCRIPTION	CATALOG #	SIZE
Mouse B220/CD45R	Monoclonal Rat IgG_{2B} (clone # RA3-6B2)	MLDP7	1 Vial
Mouse CD3	Monoclonal Rat IgG_{2B} (clone # 17A2)	MLDP1	1 Vial
Mouse CD4	Monoclonal Rat IgG_{2B} (clone # GK1.5)	MLDP2	1 Vial
Mouse CD5	Monoclonal Rat IgG_{2B} (clone # 53-7.3)	MLDP3	1 Vial
Mouse CD8α	Monoclonal Rat IgG_{2B} (clone # 53-6.7)	MLDP4	1 Vial
Mouse Integrin αM/CD11b/MAC-1	Monoclonal Rat IgG_{2B} (clone # M1/70)	MLDP5	1 Vial
Mouse Gr-1/Ly-6G	Monoclonal Rat IgG_{2B} (clone # RB6-8C5)	MLDP6	1 Vial
Mouse TER-119/Ly76	Monoclonal Rat IgG_{2B} (clone # TER-119/Ly76)	MLDP8	1 Vial



Enrichment of SCF R/c-kit Cells. SCF R/c-kit staining of bone marrow lineage negative cells isolated from BALB/c mice using the MagCellect™ Mouse Hematopoietic Cell Lineage Depletion Kit (Catalog # MAGM209). Histograms reflect reactivity of all viable cells with PE-conjugated Rat Anti-Mouse SCF R/c-kit Monoclonal Antibody (Catalog # FAB1356P; filled histogram) or a PE-conjugated Rat IgG_{2A} Isotype Control (Catalog # IC006P; open histogram). Inset shows SCF R/c-kit staining of cells before depletion.



Human Colony Forming Cell Assays on PMBCs. The colony forming cell (CFC) assay was performed on human peripheral blood mononuclear cells (PMBCs) cultured for 14 days using Human Methylcellulose Serum-Free Enriched Media (Catalog # HSC005SF). Image shows colonies of burst forming unit-erythroid cells.



Hematopoietic Lineage Depletion. Lineage marker reactivity on BALB/c bone marrow (BM) cells processed with the MagCellect Mouse Hematopoietic Cell Lineage Depletion Kit (Catalog # MAGM209). Histograms show reactivity of BM cells labeled with the cocktail of biotinylated antibodies (Rat Anti-Mouse CD5, CD11b, B220/CD45R, Gr-1/Ly-6G, and TER-119) included in the kit both before (green histogram) and after (purple histogram) magnetic depletion. Lineage marker reactivity was detected using Streptavidin-PE.

Mouse Hematopoietic Cell Lineage Depletion Kit

The Mouse Hematopoietic Cell Lineage Depletion Kit is designed to be used in conjunction with R&D Systems MagCellect cell enrichment system. Lineage committed cells targeted for depletion include T cells, B cells, NK cells, monocytes/macrophages, granulocytes, and erythrocytes.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Mouse Hematopoietic Cell Lineage Depletion Kit	Biotinylated lineage depletion antibody cocktail, MagCellect streptavidin ferrofluid, blocking buffer, wash buffer. Each kit processes up to 1 x 10^9 cells.	MAGM209	1 Kit

Hematopoietic Multi-Color Flow Cytometry Kit

A kit to simultaneously verify the expression of HSC markers using three fluorochrome-conjugated antibodies.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Mouse Hematopoietic Progenitor Cell 3-Color Flow Kit	Conjugated antibodies to mouse CD244-Fluorescein (Goat IgG), CD150-APC (Rat IgG_{2A}, Clone 459911), CD48-PE (Rat IgG_1, Clone 331504). Kits also contain appropriate staining buffers and specific isotype controls.	FMC005	25 tests

Methylcellulose-based Reagents for Colony Forming Cell Assays

The colony forming cell (CFC) assay is the standard *in vitro* assay for quantifying clonogenic progenitors present in human, murine, and primate bone marrow, umbilical cord blood, peripheral blood, and mobilized peripheral blood. This assay relies on the ability of hematopoietic progenitors to proliferate and differentiate into distinct colonies in a semi-solid media in response to cytokine stimulation. Hematopoietic colony forming assays may be used to evaluate potential toxic effects of new compounds and to determine maximum tolerated doses (MTD) and inhibitory concentration values (IC_{50}).

		COLONIES SUPPORTED BY METHYLCELLULOSE PRODUCTS					
PRODUCT NAME	CATALOG #	CFU-E	BFU-E	CFU-G	CFU-M	CFU-GM	CFU-GEMM
Methylcellulose Stock Solution Solution that contains 3% methylcelullose in Iscove's MDM and can be used for both human and mouse HSC research.	HSC001*	N/A	N/A	N/A	N/A	N/A	N/A
Human Methylcellulose Base Media Media that contains all of the basic components required to perform human CFC assays, except the cytokines, allowing researchers to customize the media to their specific research needs.	HSC002*	N/A	N/A	N/A	N/A	N/A	N/A
Human Methylcellulose Serum-Free Base Media Serum-free media that contains all of the basic components, except the cytokines, required to perform human CFC assays for HSC research.	HSC002SF*	N/A	N/A	N/A	N/A	N/A	N/A
Human Methylcellulose Complete Media Specifically formulated media supplemented with recombinant human GM-SCF, IL-3, SCF, and Epo. Suitable for routine assays of human clonogenic hematopoietic progenitors from human bone marrow, peripheral blood, cord blood, leukopheresis products, and purified $CD34^+$ cells.	HSC003	+	+	+	+	+	+
Human Methylcellulose Complete Media without Epo Specifically formulated media supplemented with recombinant human GM-SCF, IL-3, and SCF. This media is also suitable for routine assays of human clonogenic hematopoietic progenitors similar to Catalog # HSC003.	HSC004	–	–	+	+	+	–
Human Methylcellulose Enriched Media Enriched media supplemented with recombinant human G-CSF, GM-CSF, IL-3, IL-6, SCF, and Epo. This medium is optimized for CFC assays using purified $CD34^+$ cells at the end of the long-term culture-initiating cell (LTC-IC) assay.	HSC005	+	+	+	+	+	+
Human Methylcellulose Serum-Free Enriched Media Specially formulated serum-free media supplemented with recombinant human GM-CSF, G-CSF, IL-3, IL-6, SCF, and Epo. Optimized for CFC assays of human clonogenic hematopoietic progenitors similar to Catalog # HSC005.	HSC005SF	+	+	+	+	+	+
Human Methylcellulose Serum-Free Enriched Media without Epo Specially formulated serum-free media supplemented with recombinant human GM-CSF, G-CSF, IL-3, IL-6, and SCF. This media is also suitable for routine assays of human clonogenic hematopoietic progenitors similar to Catalog # HSC005SF.	HSC010SF	–	–	+	+	+	–
Mouse Methylcellulose Base Media Media that contains all of the basic components required to perform mouse CFC assays, except the cytokines, allowing researchers to customize the media to their specific research needs.	HSC006*	N/A	N/A	N/A	N/A	N/A	N/A
Mouse Methylcellulose Complete Media Specifically formulated media supplemented with recombinant mouse IL-3, IL-6, SCF, and recombinant human Epo. Suitable for routine assays of mouse clonogenic hematopoietic progenitors from mouse bone marrow, peripheral blood, spleen, and fetal liver.	HSC007	+	+	+	+	+	+
Mouse Methylcellulose Complete Media without Epo Specifically formulated media supplemented with recombinant mouse IL-3, IL-6, and SCF. This media is also suitable for routine assays of mouse clonogenic hematopoietic progenitors similar to Catalog # HSC007.	HSC008	–	–	+	+	+	–
Mouse Methylcellulse Complete Media for Pre-B cells Specifically formulated media supplemented with recombinant mouse IL-7. For the enumeration of mouse pre-B progenitor cells.	HSC009	N/A	N/A	N/A	N/A	N/A	N/A

*Base media do not contain any cytokines and will not support colony growth unless conditioned media, cytokines, or other culture supplements are added.

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Peer-reviewed References for R&D Systems Hematopoetic Stem Cell-related Products

1. Wang, C. *et al.* (2012) TGFβ inhibition enhances the generation of hematopoietic progenitors from human ES cell-derived hemogenic endothelial cells using a stepwise strategy. Cell Res. **22**:194.

APC-conjugated Mouse Anti-Human VEGF R2/KDR Monoclonal Antibody (Catalog # FAB357A)

APC-conjugated Mouse Anti-Human Tie-2 Monoclonal Antibody (Catalog # FAB3131A)

PE-conjugated Mouse Anti-Human Endoglin/CD105 Monoclonal Antibody (Catalog # FAB10971P)

Sample: Human embryonic stem cell-derived hematopoietic progenitor cells
Application: Flow cytometry

2. Dar, A. *et al.* (2011) Rapid mobilization of hematopoietic progenitors by AMD3100 and catecholamines is mediated by CXCR4-dependent SDF-1 release from bone marrow stromal cells. Leukemia **25**:1286.

Mouse Anti-Human CXCR4 (Fusin) Monoclonal Antibody (Catalog # MAB170)

Sample: Mouse plasma and bone marrow supernatants
Application: Neutralization of progenitor cell egress from bone marrow to circulation

3. Niwa, A. *et al.* (2011) A novel serum-free monolayer culture for orderly hematopoietic differentiation of human pluripotent cells via mesodermal progenitors. PLoS One **6**:e22261.

Recombinant Human BMP-4 (Catalog # 314-BP)

Recombinant Human VEGF$_{165}$ (Catalog # 293-VE)

Recombinant Human SCF (Catalog # 255-SC)

Recombinant Human Thrombopoietin (Catalog # 288-TPN)

Recombinant Human IL-3 (Catalog # 203-IL)

Recombinant Human Flt-3 Ligand (Catalog # 308-FK)

Sample: Human embryonic and induced pluripotent stem cells
Application: Cell expansion and differentiation

Mouse Anti-Human VEGF R2/KDR Monoclonal Antibody (Catalog # MAB3571)

Sample: Human hematopoietic colonies
Application: Immunocytochemistry

4. Laurent, J. *et al.* (2011) Proangiogenic factor PlGF programs CD11b$^+$ myelomonocytes in breast cancer during differentiation of their hematopoietic progenitors. Cancer Res. **71**:3781.

APC-conjugated Mouse Anti-Human VEGF R1/Flt-1 Monoclonal Antibody (Catalog # FAB321A)

Sample: CD34$^+$ hematopoietic progenitor cells
Application: Flow cytometry

Recombinant Human SCF (Catalog #255-SC)

Recombinant Human Flt-3 Ligand (Catalog # 308-FK)

Recombinant Human IL-6 (Catalog # 206-IL)

Recombinant Human Thrombopoietin (Catalog # 288-TPN)

Sample: CD34$^+$ hematopoietic progenitor cells
Application: Cell expansion

Human PlGF Quantikine® ELISA Kit (Catalog # DPG00)

Sample: Plasma from mice bearing human breast cancer cell line-derived tumors
Application: ELISA

5. Salvucci, O. *et al.* (2012) MicroRNA126 contributes to G-CSF-induced hematopoietic progenitor cell mobilization by reducing VCAM-1 expression. Haematologica Epub ahead of print.

Rat Anti-Mouse CXCR4 Monoclonal Antibody (Catalog # MAB21651)

Fluorescein-conjugated Rat Anti-Mouse Gr-1/Ly-6G Monoclonal Antibody (Catalog # FAB1037F)

PE-conjugated Rat Anti-Mouse CXCR2 Monoclonal Antibody (Catalog # FAB2164P)

Sample: Mouse hematopoietic stem progenitor cells
Application: Flow cytometry

6. Miyamoto, K. *et al.* (2011) Osteoclasts are dispensable for hematopoietic stem cell maintenance and mobilization. J. Exp. Med. **208**:2175.

Goat Anti-Mouse SCF R/c-kit Antigen Affinity-purified Polyclonal Antibody (Catalog # AF1356)

Sample: Mouse decalcified bone
Application: Immunohistochemistry

Mouse M-CSF Quantikine ELISA (Catalog # MMC00)

Sample: Mouse serum
Application: ELISA

7. Kaplan, M. *et al.* (2011) STAT3-dependent IL-21 production from T helper cells regulates hematopoietic progenitor cell homeostasis. Blood **117**:6198.

Goat Anti-Mouse IL-21 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF594)

Goat Anti-Mouse IL-22 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF582)

Recombinant Mouse IL-21 (Catalog #594-ML)

Sample: Mouse
Application: *In vivo* administration

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