FocusOn No.053

Stem Cell Markers

Antibodies to Mesenchymal Stem Cells

Mesenchymal Stem Cells (MSCs), also known as Marrow Stromal Cells, are multipotent stem cells found in the stroma of non-hematopoietic bone marrow. MSCs have a large capacity for self-renewal while maintaining their multipotency . MSCs and MSC-like cells have now been isolated from various sites other than the bone marrow, including adipose tissue, amniotic fluid, periosteum, and fetal tissues, and show phenotypic heterogeneity. MSC-like cells have been isolated from pathological tissues such as the rheumatoid arthritic joint, and these cells express bone morphogenetic protein receptors. Indeed, it has been suggested that cells with mesenchymal stem characteristics reside in virtually all postnatal organs and tissues. In a steady state of cell turnover, or in response to trauma, MSCs are induced to differentiate into a wide array of cells types including osteoblasts, chondrocytes, myocytes, adipocytes, beta-pancreatic islet cells and possibly neuronal cells.

Markers expressed by mesenchymal stem cells include CD105 (SH2), CD73 (SH3/4), CD44, CD90 (Thy-1), CD71 and Stro-1 as well as the adhesion molecules CD106, CD166, and CD29. Among negative markers for mesenchymal stem cells (not expressed) are hematopoietic markers CD45, CD34, CD14, CD11 and the costimulatory molecules CD80, CD86 and CD40 as well as the adhesion molecules CD31, CD18 and CD56.

CD105

Endoglin, also known as CD105, is a type I integral transmembrane glycoprotein and is an accessory receptor for TGF-beta superfamily ligands. Endoglin is highly expressed on vascular endothelial cells, chondrocytes, and syncytiotrophoblasts of term placenta. It is also found on activated monocytes, mesenchymal stem cells and leukemic cells of lymphoid and myeloid lineages.

CD73

CD73, an ecto-5'-nucleotidase, is a glycosyl phophatidylinositol-anchored ectoenzyme that forms a disulfide-linked homodimer. The 5'-nucleotidase activity of CD73 converts extracellular nucleoside 5'-monophosphates to nucleosides. It is one of several enzymes responsible for the production of extracellular adenosine, a signaling molecule that is involved in responses to inflammation and tissue injury. Most cell types express CD73.

CD44

CD44 is an 80 to 250 kDa type I transmembrane glycoprotein that binds hyaluronan and a variety of extracellular as well as cell-surface ligands. The molecule exists in multiple spliced forms and shows enormous variability in glycosylation.

Fig. 1: Formalin-fixed paraffin-embedded (FFPE) prostate tissue (vessel) stained with CD105 antibody ***Cat.-No. AP08365PU-N***

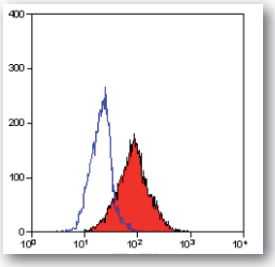

Fig. 2: Staining of KG1 cells with CD105 antibody ***Cat.-No. SM1177P***

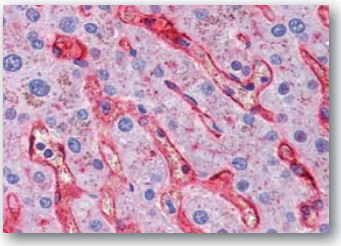

Fig. 3: Human liver (FFPE) stained with CD73 antibody ***Cat.-No. AM20411SU-N***

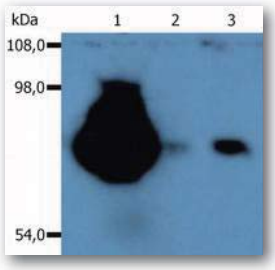

Fig. 4: Western blotting analysis (non-reducing conditions) of isolated peripheral blood lymphocytes of various species using anti-CD44 (MEM-263)
Cat.-No. SM3024P
Lane 1: lysate of human PBL
Lane 2: lysate of canine PBL
Lane 3: lysate of porcine PBL

CD90

CD90, also known as Thy1, is a GPI-linked glycoprotein expressed by endothelial cells, hematopoietic stem cells, and in developing nervous tissue. Unlike human CD90, mouse CD90 is also highly expressed on T cells and is involved in T cell activation.

CD106

Human VCAM-1 (CD106), a member of the immunoglobulin superfamily, is a cell surface protein expressed by activated endothelial cells and certain leukocytes such as macrophages. VCAM-1 expression is induced by IL-1beta, IL-4, TNF-alpha and IFN-gamma. VCAM-1 binds to leukocyte integrins VLA-4 and Integrin alpha 4 beta 7.

CD166

Activated leukocyte cell adhesion molecule (ALCAM) is a type I membrane glycoprotein that is a member of the immunoglobulin superfamily. It is also known as CD166, MEMD, SC-1/DM-GRASP/BEN in the chicken, and KG-CAM in the rat.

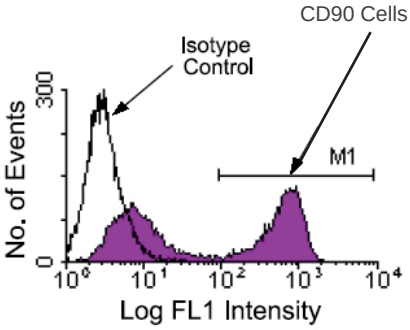

Fig. 5: *Immunofluorescent staining: BALB/c mesenteric lymph node cells were stained with either rat IgG2c-FITC (as a negative control) or rat anti-mouse CD90-FITC* ***Cat.-No. AM08054FC-N****. Lymphocytes were then gated and analyzed on a FACScan(TM) flow cytometer (BDIS, San Jose, CA)*

The table below summarizes Acris Antibodies mesenchymal stem cell antibodies. Refer to **www.acris-antibodies.com** and our other FocusOn antibody panel for a comprehensive listing of our products for stem cells research:

FocusOn 104: Primordial Germ Cells and Ectoderm
FocusOn 105: Neural Stem Cells
FocusOn 106: Embryonic Stem Cells
FocusOn 053: Mesenchymal Stem Cells
FocusOn 054: Hematopoietic Stem Cells
FocusOn 055: Induced Pluripotency (iPS)

Selected Acris Antibodies Panel to Mesenchymal Stem Cell Markers

Name	Host/Isotype	Clone	Reactivity	Application	Format	Catalog-No.*	other Formats			
CD44 / PGP-1 / HUTCH-I	Rabbit	-	Hu	P	Purified	AP15444PU-S	-	-	-	-
	Rabbit	-	Hu, Ms, Rt	IP, P, WB	Aff-Purified	AP00142PU-N	-	-	-	-
	Mouse IgG2b	5C10	Hu	E, P, WB	Purified	AM03178PU-N	-	-	-	-
	Mouse IgG1	5035-41.1D	Ms	F, IP	Purified	SM030P^S	-	-	FC^S	PE^S
	Rat IgG2a	KM81	Ms	C, F	Purified	CL023P	AF	BT	FC	PE
	Rat IgG2b	IM7	Can, Eq, Fe, Hu, Ms	C, F, IF, IP, P, WB	Purified	AM12065PU-N	-	-	FC	-
	Rabbit IgG	SP37	Hu	P	Purified	AM11108PU-S	-	-	-	-
	Mouse IgG2a	SPM521	Hu	P	Purified	AM11107PU-S	-	-	-	-
	Mouse IgG1	MEM-263	Can, Hu, Por	F, IP, P, WB	Purified	SM3024P	-		FC	PE
	Mouse IgG2a	OX-49	Rt	C, F, IP, P, WB	Purified	CL110P	-	BT	FC	-
CD73	Rabbit	-	Hu	E, P, WB	Purified	AP11872PU-N	-	-	-	-
	Mouse IgG2b	2B6	Hu	E, P, WB	Purified	AM03116PU-N	-	-	-	-
	Mouse IgG1	1D7	Hu	E, P	Ascites	AM20411SU-N	-	-	-	-
CD90	Mouse IgG1	5E10	Hu, Mky	C, F, IP, P	Aff-Purified	AM20160PU-N	-	-	-	-
	Rat IgG2c	G7	Ms	C, F, FN	Purified	AM08054PU-N	LE	BT	FC	PE
	Mouse IgG2b	5a-8	Ms	C, CT, F	Purified	CL039P		BT	FC	PE
	Mouse IgG1	OX-7	GP, Ms, Rb, Rt	C, F, IP, WB	Purified	SM049P^S	LE	BT^S	FC^S	PE^S
	Mouse IgG1	F15-42-1	Hu, Mky	C, F, IP	Purified	SM1170P^S	AF	BT^S	FC^S	PE^S
CD105 / Endoglin	Rabbit IgG	-	Hu	P	Aff-Purified	AP08365PU-N	-	-	-	-
	Rabbit	-	Hu	P	Purified	AP15414PU-S	-	-	-	-
	Rabbit	SN6	Hu	C, F, IP, WB	Purified	SM1177P^S	-	-	FC^S	PE^S
	Mouse IgG2a	MEM-229	Hu, Por	F, WB	Purified	AM03092PU-N	-	-	FC	PE
CD106 / VCAM1	Mouse IgG1	1.G11B1	Hu, Mky, Por	C, E, F, IP	Aff-Purified	SM1178P	-	-	FC^S	-
	Mouse IgG1	6G9	Hu	E, P, WB	Ascites	AM20480SU-N	-	-	-	-
	Mouse IgG1	STA	Hu	F, IP	Purified	AM05549PU-N^S	LE	-	-	PE^S
CD166	Mouse IgG1	10F1G12	Hu	E, P	Ascites	AM20392SU-N	-	-	-	-
	Mouse IgG2a	3F8B12	Hu	E, P, WB	Ascites	AM20451SU-N	-	-	-	-

* Cat.-No for unconjugated format; other formats have different Cat.-No. endings; Please look up at www.acris-antibodies.com or inquire!

^{S} Sample size aquirable

Reactivity: Can: Canine, Eq: Horse, Fe: Cat, GP: Guinea pig, Hu: Human, Mky: Monkey, Ms: Mouse, Por: Pig, Rb: Rabbit, Rt: Rat

Application: C: Immunohistochemistry on frozen sections, CT: Cytotoxicity assay, E: ELISA, F: Flow cytometry, FN: Functional assay, IF: Immunofluorescence, IP: Immunoprecipitation, P: Immunohistochemistry on formalin-fixed, paraffin-embedded tissue sections, WB: Western blot

Formats: AF: Azide free, BT: Biotin label, FC: FITC label, LE: Low Endotoxin, PE: Phycoerythrin label

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