Cancer MDR Research

Dear Scientist:

KAMIYA BIOMEDICAL COMPANY has been supplying the research community with antibodies and biochemicals for multidrug resistance (MDR) studies for over 20 years.

In 1991, KAMIYA introduced the anti-P-glycoprotein mAb, clone MRK16, an antibody developed by Hamada and Tsuruo which has specificity to an external epitope of P-glycoprotein. MRK16 has been shown to interfere with the function of P-glycoprotein, and to recognize only the human class I isoform of P-glycoprotein. Since then, hundreds of papers have been published on this antibody.

Today, KAMIYA offers the most complete selection of antibodies to all MDR proteins including:

- BCRP
- MDR1
- MDR3
- MDR-Associated Protein
- MRP1
- MRP2
- MRP3
- MRP4
- MRP5
- MRP6
- MRP7
- MRP8
- MRP9
- MRP14
- Sister of P-glycoprotein
- LRP/MVP
- VPARP

In addition, KAMIYA offers a number of biochemicals for studies of MDR such as several MDR1 inhibitors.

Cancer Multidrug Resistance Overview

Proteins capable of conferring MDR are found in several distinct subfamilies of ATP binding cassette (ABC) transporter proteins:

- P-glycoprotein (MDR1, ABCB1) was the first discovered and is probably the most widely observed protein associated with clinical MDR.
- Two other ABC transporters: the multidrug resistance protein 1 (MRP1, ABCC1), and the mitoxantrone resistance protein (MXR/BCRP, ABCG2) have been shown to participate in the MDR of tumors.
- In addition to MRP1, five homologues (MRP2-MRP6) have been recently cloned. Overexpression of MRP2 was definitively shown to confer cancer MDR. MRP3, an organic conjugate transporter, and MRP5, a nucleoside transporter, are also potential proteins for causing certain forms of drug resistance.
- Other human ABC proteins capable of actively transporting various compounds out of cells may also be players in selected cases of MDR. These include ABCB4 (MDR3) and ABCB11 (sister Pgp or BSEP).

An additional protein involved in MDR was indentified from clinical studies on an MDR-associated protein originally termed Lung Resistance-related Protein (LRP). LRP was found to be the human major vault protein. LRP/MVP is overexpressed in a wide variety of Pgp negative MDR cancer cell lines including some that are MRP negative.

Vault-poly (ADP-ribose) polymerase (VPARP), a minor vault protein, may also have a role in MDR.

KAMIYA BIOMEDICAL COMPANY
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rev. 2012-02-17

KAMIYA BIOMEDICAL COMPANY is the industry leader in supplying

Multidrug Resistance (MDR) Antibodies

Antibody	Clone	Reactivity*	Application**	Cat. No.	Size	Price
Anti-BCRP mAb	BXP-9	M	IC, IHC, W	MC-980	1 ml	$575
Anti-BCRP mAb	BXP-21	H	IC, IHC, W	MC-177 MC-236	0.5 ml 1 ml	$361 $617
Anti-BCRP mAb	BXP-34	H	FC, IC, IHC	MC-173 MC-226	0.5 ml 1 ml	$361 $616
Anti-BCRP mAb	BXP-53	H, M	IC, IHC, W	MC-981	1 ml	$575
Anti-Cytokeratin 7 mAb	RN7	H	IHC	MC-901	1 mL	$665
Anti-LRP / MVP (Major Vault Protein) mAb	LMR5	H	FC, IHC	MC-600 MC-601	0.5 ml 1 ml	$361 $616
Anti-LRP / MVP mAb	LRP-56	H	FC, IC, IHC	MC-077 MC-069	0.5 ml 1 ml	$361 $616
Anti-LRP / MVP mAb	1032	H, R	FC, IHC, IP, W	MC-603	100 µg	$531
Anti-LRP / MVP mAb	MVP-37	H	IHC, W	MC-172 MC-225	0.5 ml 1 ml	$360 $648
Anti-LRP / MVP mAb	1011	H	IHC, W	MC-240	100 µg	$370
Anti-LRP / MVP mAb	1014	H	IHC, W	MC-895	100 µg	$371
Anti-LRP / MVP mAb	1027	H	IHC, W	MC-242	100 µg	$370
MDR Sampler Pack (JSB-1, LRP-56, MRPm6, MRPr1)	Various, see individual products for details			MC-898	0.25 mL ea.	$572
Anti-MDR-Associated Protein 1 mAb	33A6	H	IHC	MC-115	1 ml	$724
Anti-MDR-Associated Protein 3 mAb	DTX1	H	IHC	MC-116	1 ml	$709
Anti-MDR1 P-Glycoprotein mAb	F4	H, HM	FC, IF, IHC, W	MC-208	100 µg	$458
Anti-MDR1 P-Glycoprotein (Chinese Hamster) mAb	265/F4	HM	FC, IF, IHC, W	MC-215	100 µg	$469
Anti-MDR1 P-Glycoprotein mAb	JSB-1	H, HM	FC, IC, IHC, W	MC-166 MC-209	0.5 ml 1 ml	$361 $596
Anti-MDR1 P-Glycoprotein mAb (Inhibits MDR1)	MRK16	H	MDR1 Inhibition, FC, IHC, IP	MC-012	150 µg	$560
Anti-MDR1 P-Glycoprotein mAb, No BSA/Azide	MRK16	H	MDR-1 Inhibition, FC, IHC, IP	MC-017	150 µg	$560
Anti-MDR3 P-Glycoprotein mAb	P3II-26	GP, H	FC, IC, IHC, W	MC-171 MC-224	0.5 ml 1 ml	$361 $617
Anti-MRP1 mAb	MRPm5	H	FC, IC, IHC, W	MC-162 MC-203	0.5 ml 1 ml	$361 $575
Anti-MRP1 mAb	MRPm6	H	FC, IC, IHC, W	MC-161 MC-202	0.5 ml 1 ml	$361 $616
Anti-MRP1 mAb	MRPr1	H	FC, IC, IHC, W	MC-160 MC-201	0.5 ml 1 ml	$359 $610
Anti-MRP1 mAb	QCRL-1	H, MK	FC, IC, IHC, IP, W	MC-231	1 ml	$422
Anti-MRP1 mAb (Inhibits MRP1)	QCRL-2	H, M, MK, R	F, FC, IC, IP	MC-232	1 ml	$422
Anti-MRP1 mAb (Inhibits MRP1)	QCRL-3	H, MK	F, FC, IC, IP	MC-233	1 ml	$422
Anti-MRP1 mAb (Inhibits MRP1)	QCRL-4	H, M, MK, R	F, FC, IC, IP	MC-234	1 ml	$422
Anti-MRP2 / cMOAT mAb	M2III-5	H, M, R	IC, IHC, W	MC-267	1 ml	$604
Anti-MRP2 / cMOAT mAb	M2I-4	H	FC, IC, IHC, W	MC-163 MC-205	0.5 ml 1 ml	$361 $575
Anti-MRP2 / cMOAT mAb	M2II-12	H	IC, IHC, W	MC-165 MC-207	0.5 ml 1 ml	$361 $596
Anti-MRP2 / cMOAT mAb	M2III-6	H, R	IC, IHC, W	MC-164 MC-206	0.5 ml 1 ml	$361 $575

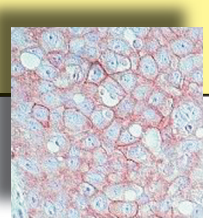
** Reactivity:* *A = amphibian, B=bovine, BA=bacteria, CH=chicken, D=dog, EQ=horse, G=goat, GP=guinea pig, H=human, HM=hamster, M=mouse, MK=monkey, P=porcine, R=rat, RB=rabbit, S=sheep, X=Xenopus*

Multidrug Resistance (MDR) Antibodies

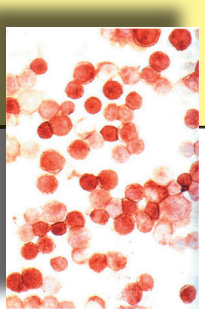
Antibody	Clone	Reactivity*	Application**	Cat. No.	Size	Price
Anti-MRP3 mAb	M3II-21	H	IC, IHC, W	MC-168 MC-217	0.5 ml 1 ml	$361 $596
Anti-MRP3 mAb	M3II-9	H	IC, IHC, W	MC-167 MC-216	0.5 ml 1 ml	$361 $596
Anti-MRP4 mAb	M4I-10	H	IC, IHC, W	MC-272	1 ml	$603
Anti-MRP4 mAb	M4I-80	H, M	IC, IHC, W	MC-273	1 ml	$603
Anti-MRP4 pAb	Polyclonal	H	IHC, W	PC-063	200 µl	$290
Anti-MRP5 mAb	M5I-1	H	IC, IHC, W	MC-169 MC-218	0.5 ml 1 ml	$361 $596
Anti-MRP5 mAb	M5II-54	H	IC, IHC, W	MC-170 MC-219	0.5 ml 1 ml	$361 $596
Anti-MRP5 mAb	M5I-10	H	IC, IHC, W	MC-1049	1 mL	$616
Anti-MRP6 mAb	M6II-7	H	IC, IHC, W	MC-488	1 ml	$617
Anti-MRP6 mAb	M6II-21	H	IC, IHC, W	MC-486	1 ml	$616
Anti-MRP6 mAb	M6II-31	H	IC, IHC, W	MC-487	1 ml	$616
Anti-MRP7 mAb	M7I-3	H	IC, IHC, W	MC-1050	1 mL	$616
Anti-MRP8 mAb	M8I-74	H	IC, IHC, W	MC-1046	1 mL	$616
Anti-MRP9 mAb	M9I-38	H	IC, IHC, W	MC-1047	1 mL	$616
Anti-MRP9 mAb	M9II-3	H	IC, IHC, W	MC-1048	1 mL	$616
Anti-MRP14 mAb	47-8D3	H	IHC, E, W	MC-479	100 µg	$366
Anti-Nucleolar Protein Nsr1p mAb	31C4	Yst	IC, IF, W	MC-007	200 µl	$290
Anti-Sister of P-Glycoprotein (SPGP) mAb	USal-hBSEP-McAb-1	H	IC, IHC, W	MC-333	100 µg	$350
Anti-Sister of P-Glycoprotein (SPGP) pAb	Polyclonal	H, M, R	W	PC-064	200 µl	$310
Anti-Topoisomerase II-α pAb	Polyclonal	H	IF, IHC, IP, W	PC-123	500 µg	$469
Anti-VPARP (Minor Vault Protein) mAb	P193-10	H	IHC, W	MC-174 MC-227	0.5 ml 1 ml	$335 $575
Anti-VPARP (Minor Vault Protein) mAb	p193-4	H	IHC, W	MC-175 MC-228	0.5 ml 1 ml	$335 $575
Anti-VPARP (Minor Vault Protein) mAb	P193-6	H	IHC, W	MC-176 MC-229	0.5 ml 1 ml	$335 $575

** Application: AP=affinity purification, E=ELISA, F=functional activity, FC=flow cytometry, GS=gel supershift assay, IC=immunocytochemistry, IF=immunofluorescence, IHC=immunohistochemistry, IP=immunoprecipitation, TLC=thin-layer chromatography, W=western blot

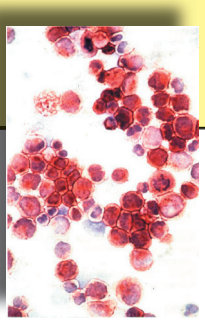
> Cancer Multidrug Resistance (MDR)



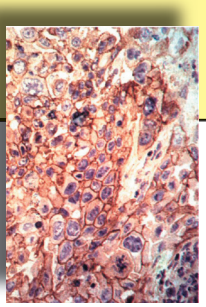
human breast carcinoma stained with MC-208



non-small-cell lung carcinoma cells stained with MC-209



small-cell lung carcinoma cells stained with MC-202



ovarian carcinoma cells stained with MC-201

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Important Information on Cancer Multidrug Resistance (MDR) Studies