

HotLines

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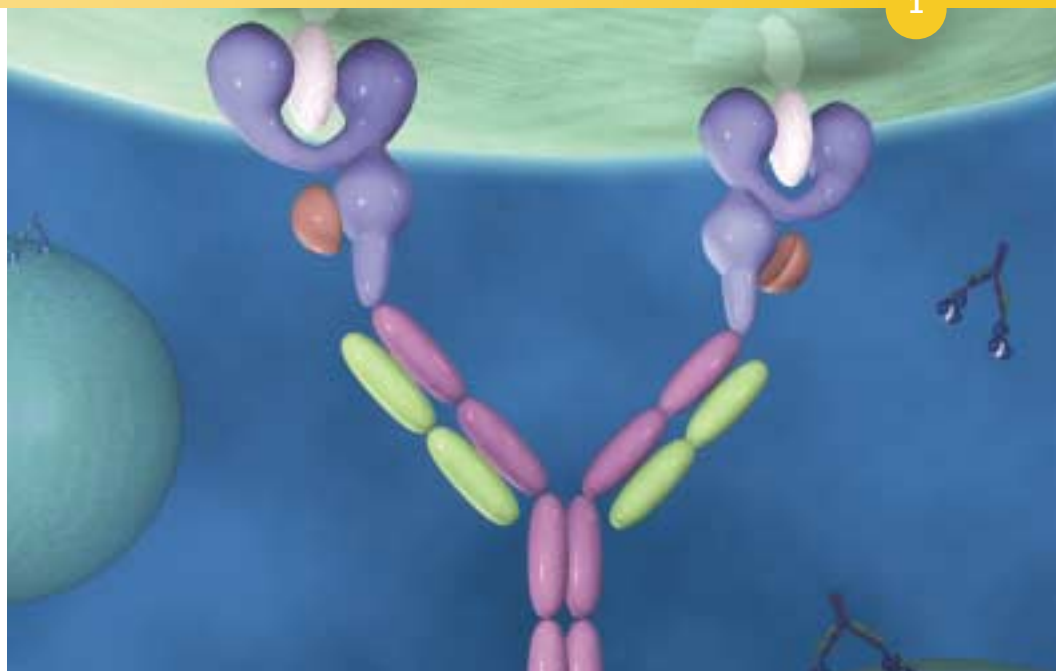
DimerX Peptide Presentation Technology

DimerX HLA-A2 Reagent Now Available for Flow Cytometric Analysis of Antigen Specific T Cells

By Dara Grantham Wright,
Sammee VanArsdale, Ph.D.,
and Bing-Yuan Wei, Ph.D.

The major histocompatibility complex (MHC) gene locus encodes a group of highly polymorphic cell surface proteins that play a broad role in the immune response to protein antigens. MHC molecules present antigenic protein fragments to antigen-specific receptors expressed by T cells (TCR). Human (human leukocyte antigen/HLA) and mouse (histocompatibility 2/H-2) MHC molecules are structurally and functionally related proteins that

comprise two major classes. Class I MHC molecules consist of two separate polypeptide chains. The class I α chain is an MHC encoded, trans-membrane polypeptide containing three extracellular domains: $\alpha 1$, $\alpha 2$, and $\alpha 3$. The second chain consists of a non-MHC encoded polypeptide called β_2 microglobulin (β_2 M). Since β_2 M does not contain a transmembrane domain, it associates with the



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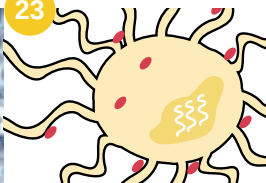
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DimerX Peptide Presentation Technology *(continued from cover)*

α chain through non-covalent interaction. Functionally, class I MHC molecules can bind peptides derived from intracellular parasites (*e.g.*, viral and some bacterial antigens) that are specifically recognized by CD8⁺ T cells. Class II MHC molecules consist of two different transmembrane proteins that can bind peptide fragments derived from extracellular parasites (*e.g.*, bacteria and fungi) and are specifically recognized by CD4⁺ T cells. TCR recognize both processed peptides bound to MHC, as well as regions of the MHC molecule itself. CD4 and CD8 accessory molecules strengthen formation of the TCR complex-MHC through their interaction with non-polymorphic regions of the MHC molecule.

Recently, recombinant MHC molecules useful for studying T cell function have been produced^{1,2} and are of increasing interest to investigators for study of the immune response to viral antigens and in vaccine development. BD Biosciences PharMingen is pleased to announce the availability of a new line of DimerX Class I MHC:Ig proteins for analysis of antigen specific T cells. The DimerX technology has been developed based on the natural immunological process of MHC association with an antigenic peptide that is necessary for stimulation of CD8⁺ T cells.

We are proud to announce the addition of human class I reagents to the DimerX technology family. DimerX I HLA-A2 provides an easy-to-use method for antigen specific T-cell analysis by offering a flexible peptide loading system appropriate for large-scale epitope mapping experiments. Additionally, the DimerX I fusion proteins are provided to the investigator supplemented with recombinant β_2 M. DimerX I recombinant proteins are produced in eukaryotic cell lines in order to provide greater conformational integrity and easier peptide loading. The peptide

loading protocol is a simple method involving passive loading of peptide in solution with the DimerX fusion protein, indirect immunofluorescent staining, and flow cytometric analysis.

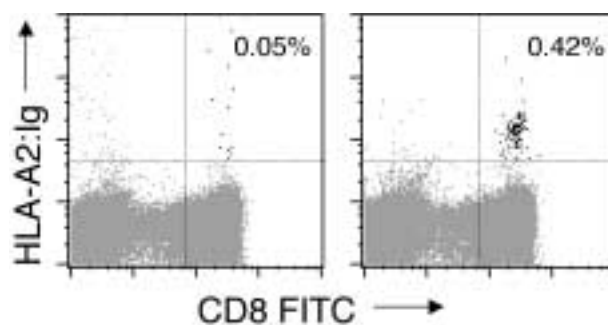


Figure 1. Flow cytometric analysis of normal human lymphocytes from a cytomegalovirus (CMV) seropositive donor. DimerX HLA-A2:Ig was loaded with a CMV pp65-derived, HLA-A2-binding peptide (NLVPMVATV) at 640 molar excess. PBMC were stained with unloaded (left panel) or loaded (right panel) purified HLA-A2:Ig, then stained with anti-mouse IgG1-PE (PharMingen), anti-CD14-APC and HLA-DR-APC (BD Immunocytometry systems), and anti-CD8-FITC.

Antibody conjugates were chosen to be non-IgG1 isotypes, so as not to interfere with detection of HLA-A2:Ig staining. Cells were collected with a lymphocyte gate and were subsequently gated to exclude APC-positive cells. Percentages shown are percent of CD8⁺ cells stained for HLA-A2:Ig.

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Products Available from PharMingen

Cat. No.	New. Cat. No.	Description	Format	Size
24641N	551263	DimerX I Soluble HLA-A2:Ig Fusion Protein	Purified	50 μ g
24591C	550750	DimerX I Soluble Dimeric Mouse H-2Kb:Ig Fusion Protein	Purified	0.25 mg
24601C	550751	DimerX I Soluble Dimeric Mouse H-2Ld:Ig Fusion Protein	Purified	0.25 mg
02235A	550083	Anti-mouse IgG ₁	PE	0.1 mg

Antibodies Available from BD Immunocytometry Systems

340436	Human CD14	M ϕ P9	APC	100 tests
340549	Human HLA-DR	L243	APC	100 tests

DimerX technology has been exclusively licensed to Becton, Dickinson, and Company.

Matrix Metalloproteinases

By Tiffany Herold

Matrix metalloproteinases (MMPs) belong to a family of enzymes that digest specific extracellular matrix (ECM) components and thereby contribute to matrix equilibrium and structural integrity. The members of the MMP family are distinguished by the substrates they degrade (**Table 1**). With the exception of MMP-11 and some membrane type MMPs (MT-MMPs), which are activated intracellularly by furin-like proteases, MMPs are secreted as inactive pro-enzymes and can be activated extracellularly by several mechanisms¹. For example, proMMP-9 is activated by MMP-3, proMMP-1 is activated by mast cell chymase, and proMMP-2 is activated by MT1-MMP (**Figure 1**)². *In vivo*, the uPA/plasmin system is an important activator of proMMPs³. The activation mechanism involves the disruption of the cysteine-Zn²⁺ bond by a conformational change or proteolysis followed by the removal of the propeptide^{2,3}. The MMP family members share a basic structure including a signal peptide, a propeptide, a catalytic domain with a Zn²⁺ binding site, a proline-rich hinge region, and a hemopexin-like domain^{1,2}. MMP-7, which is the smallest family member, lacks the hemopexin-like domain¹. MT-MMPs also have a short carboxyl-terminal transmembrane domain and an intracellular domain¹.

The MMP enzymes are regulated mainly by tissue inhibitors of MMPs (TIMPs), but can also be inhibited by α -macroglobulins, synthetic peptides, and nonpeptide antagonists^{2,4}. TIMPs non-covalently bind to the active site of MMPs, but can also bind to other domains of MMP-2 and MMP-9⁵. Currently, four TIMPs have been characterized: TIMP-1, TIMP-2, and TIMP-4 are present in soluble form while TIMP-3 is bound to the ECM^{1,5,6}. TIMPs share conserved structural features including a leader sequence that is cleaved to produce a mature protein and a conserved NH₂-terminal domain, which interacts with the Zn²⁺ binding pocket of active MMPs and is necessary for inhibitory activity^{5,7}. The C-terminal domain of TIMPs is variable and binds to the hemopexin-like domain of proMMPs⁷.

Expression and Regulation

MMPs and TIMPs are expressed in many different cell types (**Table 1**). With the exception of neutrophil-derived MMPs (MMP-8 and MMP-9), which are stored in granules ready for release, MMP production is highly regulated by growth factors, hormones, cytokines, cellular transformation, and cell-matrix or cell-cell interactions^{2,3,8}. For example, T cells secrete both MMP-2 and MMP-9 when activated by VCAM-1 dependent adherence to basement membrane, IL-2, eicosanoids and vasoactive intestinal peptide (VIP), while proinflammatory chemokines RANTES, MIP-1 α and MIP-1 β induce MMP-9 production alone^{2,6}. Macrophages produce MMP-1 and MMP-9 when stimulated by activated T cells, and they produce MMP-3 and MMP-7 along with MMP-9 when stimulated by LPS². Macrophage production of MMP-1, MMP-7, and MMP-9 is suppressed by IL-4, IL-10, and IFN- γ ². Fibroblasts can be activated to express MMP-1, MMP-2, and MMP-3 by EMMPRIN, a factor on tumor cell surfaces^{1,3}. TIMP-1 also stimulates fibroblasts to produce MMP-1³. TIMPs are constitutively expressed by many cell types and are present in most tissues and body fluids. TIMPs can be upregulated in response to several stimuli including phorbol esters, growth factors, cytokines, and serum⁵.

Function

Interaction of cells with the ECM is critical for the normal development and function of organisms (**Figure 2**). The turnover and remodeling of the ECM must be highly regulated to prevent abnormal development and generation of a pathological condition (**Table 2**). Many studies support the role of MMPs and TIMPs in ECM remodeling and function.

MMPs have been shown to alter the biological functions of ECM macromolecules by specific proteolysis³. Disruption of the ECM regulates signal transduction pathways resulting in many cellular responses, such as apoptosis, release of chemotactic factors, and possibly recruitment of neutrophils⁸. MMPs can also cleave non-EMC proteins such as α 1-antitrypsin. Cleavage of α 1-anti-trypsin enhances neutrophil elastase activity, generates chemotactic factors, and can enhance tumor growth⁸.

Matrix Metalloproteinases *(continued from page 3)*

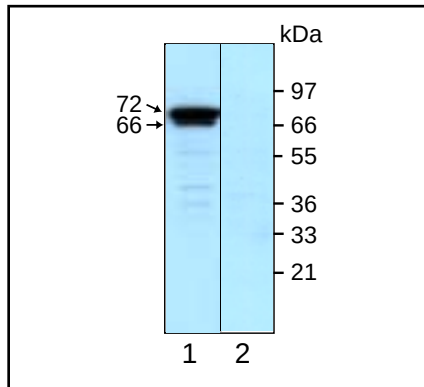
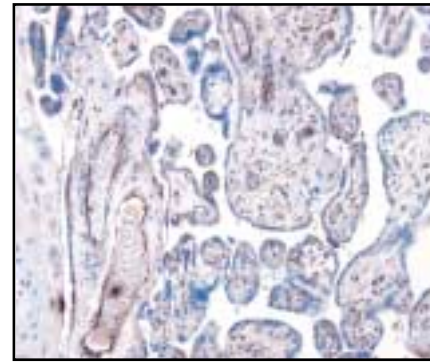


Figure 1. Western blot analysis of MMP-2. HT-1080 human fibrosarcoma cell lysate prepared with a solution containing 1% SDS was run on a polyacrylamide gel under reducing conditions. The blot was probed with mAb A-Gel VC2 (Cat. No. 550892, Lane 1) or mouse IgG1, κ isotype control (mAb MOPC-31C, Cat. No. 557273, Lane 2) and detected by HRP-conjugated polyclonal anti-mouse Ig (Cat. No. 554002, Lanes 1 and 2). Bands were visualized using the ECL detection system (Pierce, Rockford, IL). MMP-2 is identified as 72-kDa (latent) and 66-kDa (active) bands.



Magnification 40X

Figure 2. Immunohistochemical staining of MMP-1. Formalin-fixed paraffin sections of human placenta were stained with anti-MMP-1 antibody (Cat. No. 551000). Slides were developed with Streptavidin-HRP and DAB substrate. Fibroblasts and the endothelium of blood vessels in the chorionic villi that express MMP-1 can be identified by the brown staining.

The expression and regulation of MMPs in immune cells is necessary for movement of cells from blood to the ECM at all stages, including activation, homing to specific tissues, binding to endothelial cells, and adhesion to the ECM⁶. For example, T cells produce MMP-2 and MMP-9, which facilitate their migration through connective tissues². Macrophages secrete a wide range of MMPs that contribute to remodeling of connective tissues². In addition, MMPs are required for the secretion of TNF by T cells and macrophages and the release of active TGF- β 1 and insulin-like growth factor (IGF) from stores in connective tissues^{2,7}.

Specific inhibition of MMPs *in vivo* suppresses edema, pathological tissue proliferation, and tissue damage due to severe inflammatory and autoimmune diseases². MMPs play an integral role in tumor invasion, which is characterized by increased motility of epithelial cells and growth of metastasized tumor cells¹.

As described above for MMPs, TIMP expression is controlled in tissues to maintain a balance in the metabolism of the ECM⁴. TIMP-1 and TIMP-2 inhibit bone resorption *in vitro*, suggesting that they may participate in bone remodeling⁵. These two proteins have been shown to inhibit angiogenesis *in vitro* by inhibiting MMPs, therefore blocking endothelial cell migration and the release of matrix-bound angiogenic factors⁵. Numerous studies have also demonstrated that TIMPs inhibit cellular invasion, tumorigenesis and metastasis^{3,4}. In addition to their MMP inhibitory activity, TIMPs have erythroid potentiating activity and mitogenic activity on many cells^{4,5,7}. They can also induce morphological changes and are involved in germ cell development in both sexes^{1,5}.

Due to their critical role in regulation of the ECM, many MMPs and TIMPs are being investigated for potential therapeutic value in treatment of patients with cancer, arthritis, periodontal disease, and corneal ulceration³.

Table 1. Characteristics of MMP Family Members^{1,2,9-27}

MMP	Common Name	Substrate*	Expression
MMP-1	Collagenase-1	CN types I, II, III, V, VII, VIII, and X, aggrecan, gelatin, and serpins	Fibroblasts, keratinocytes, chondrocytes, epithelial and endothelial cells, osteoblasts, macrophages, and hepatocytes
MMP-2	Gelatinase A	CN types I, IV, V, VII, and X, gelatin, elastin, FN, LN, nidogen, active MMP-9 & active MMP-13	T lymphocytes, fibroblasts, macrophages, and platelets
MMP-3	Stromelysin-1	CN types II, IV, IX, X, and XI, LN, nidogen, FN, proteoglycan, aggrecan, elastin, gelatin, proMMP-1, proMMP-8, and proMMP-9	Fibroblasts, epithelial cells, macrophages, chondrocytes, keratinocytes, vascular smooth muscle cells, and endothelial cells
MMP-7	Matrilysin	CN type IV, elastin, proteoglycan, glycoprotein, and gelatin	Macrophages, mesangial cells, and epithelial cells
MMP-8	Collagenase-2	CN types I, II, III, and V	PMN, chondrocytes, fibroblasts, and endothelial cells
MMP-9	Gelatinase B	CN type IV, gelatin, aggrecan, LN, and nidogen	T lymphocytes, macrophages, keratinocytes, osteoclasts, endothelial cells, megakaryocytes, trophoblasts, neutrophils, and eosinophils
MMP-10	Stromelysin-2	CN type IV, LN, nidogen, FN, proteoglycan, and gelatin	Fibroblasts, epithelial cells, keratinocytes, and T lymphocytes
MMP-11	Stromelysin-3	LN, α 1-proteinase inhibitor, & α 1-antitrypsin	Mesenchymal cells, epithelial cells, and fibroblasts
MMP-12	Macrophage Elastase	Elastin	Macrophages
MMP-13	Collagenase-3	CN types I, II, III, IV, V, IX, X, and XI, gelatin, LN, tenascin, aggrecan, and FN	Fibroblasts and developing bone tissue
MMP-14	MT1-MMP	CN types I, II, and III, gelatin, FN, LN, VN, aggrecan, nidogen, tenascin, perlecan, proMMP-2, proMMP-13, & proteoglycan	Fibroblasts, epithelial cells, macrophages, and osteoclasts
MMP-15	MT2-MMP	CN types I, II, and III, proMMP-2, proMMP-13, gelatin, FN, LN, nidogen, tenascin, perlecan, VN, and aggrecan	Macrophages and fibroblasts
MMP-16	MT3-MMP	CN types I & III, FN, LN, aggrecan, perlecan, gelatin, casein, VN, proMMP-2 & proMMP-13	Brain, placenta, and vascular smooth muscle cells
MMP-17	MT4-MMP	FN, fibrin, and gelatin	Brain, reproductive tissues, and leukocytes
MMP-20	Enamelysin	Amelogenin, aggrecan, and cartilage oligomeric matrix protein (COMP)	Odontoblastic cells
MMP-23			Reproductive tissue
MMP-24	MT5-MMP	ProMMP-2 and proMMP-13	Brain
MMP-25	MT6-MMP	ProMMP-2	Neutrophils

*Abbreviations: *collagen* = CN; *fibronectin* = FN; *laminin* = LN; *vitronectin* = VN; *fibrinogen* = FG

Matrix Metalloproteinases *(continued from page 5)*

Table 2. MMP Involvement in Normal and Pathological Processes^{3,5,9}

Normal Processes	Pathological Processes
Embryonic development	Arthritis
Blastocyst implantation	Cancer
Organ morphogenesis	Periodontal disease
Nerve growth	Corneal ulceration
Ovulation	Cardiovascular disease
Cervical dilation	Multiple sclerosis
Postpartum uterine involution	Nephritis
Endometrial cycling	Neurological disease
Hair follicle cycling	Breakdown of blood brain barrier
Bone remodeling	Skin ulceration
Wound healing	Gastric ulcer
Angiogenesis	Liver fibrosis
Inflammation	Emphysema
Apoptosis	Liver cirrhosis
Immune response	Fibrotic lung disease
	Vascular diseases
	Sorsby's fundus dystrophy
	Alzheimer's disease
	Guillian-Barre disease

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Matrix Metalloproteinases Product List

Antibodies for Human MMP Research

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size	Application*
08281A	550941	MMP-1	III12b	Purified	0.1mg	WB
75831E	551000	MMP-1	III12b	Purified	1mL	IHC
08201A	550892	MMP-2	A-Gel VC2	Purified	0.1mg	IP, WB
75841E	551003	MMP-2	A-Gel VC2	Purified	1mL	IHC
08211A	550893	MMP-3	SL-1 IID4	Purified	0.1mg	WB
76061E	551117	MMP-3	SL-1 IID4	Purified	1mL	IHC
75851E	551004	MMP-7	ID2	Purified	1mL	IHC
08291A	550942	MMP-9	IIA5	Purified	0.1mg	WB
75861E	551005	MMP-9	IIA5	Purified	1mL	IHC
76071E	551118	MMP-10	IVC5	Purified	1mL	IHC
75871E	551006	MMP-11	SL3.05	Purified	1mL	IHC
08271A	550940	TIMP-1	102D1	Purified	0.1mg	IP, WB
75881E	551007	TIMP-1	102D1	Purified	1mL	IHC
08261A	550898	TIMP-2	T2-101	Purified	0.1mg	IP, WB
76081E	551119	TIMP-2	T2-101	Purified	1mL	IHC
36091A	555961	EMMPRIN	HIM6	Purified	0.1mg	FC

Related Products

66131D	556455	KB8301 MMP inhibitor
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Purified ECM proteins and EMC coated plates are available through BD Biosciences Discovery Labware

*Applications: **IHC**: immunohistochemistry; **IP**: immunoprecipitation; **WB**: western blot; **FC**: flow cytometry

Cat. No.	Specificity	Gene	Gene (continued)
Coming soon	hMMP RiboQuant Template Set 1	hMMP-1 hMMP-2 hMMP-7 hMMP-8 hMMP-9	hMMP-13 hTIMP-2 hTIMP-3 hL32 hGAPDH
Coming soon	hMMP RiboQuant Template Set 2	hMMP-1 hMMP-2 hMMP-3 hMMP-8 hMMP-14	hTIMP-1 hTIMP-2 hTIMP-3 hL32 hGAPDH
Coming soon	mMMP RiboQuant Template Set 1	mMMP-2 mMMP-3 mMMP-8 mMMP-9 mMMP-13 mTIMP-1	mTIMP-2 mTIMP-3 mTIMP-4 mL32 mGAPDH
Coming soon	mMMP RiboQuant Template Set 2	mMMP-3 mMMP-7 mMMP-8 mMMP-9 mMMP-12 mMMP-13	mTIMP-1 mTIMP-2 mTIMP-3 mL32 mGAPDH

CBA Software Flexibility and Advances

By Dan Garrett

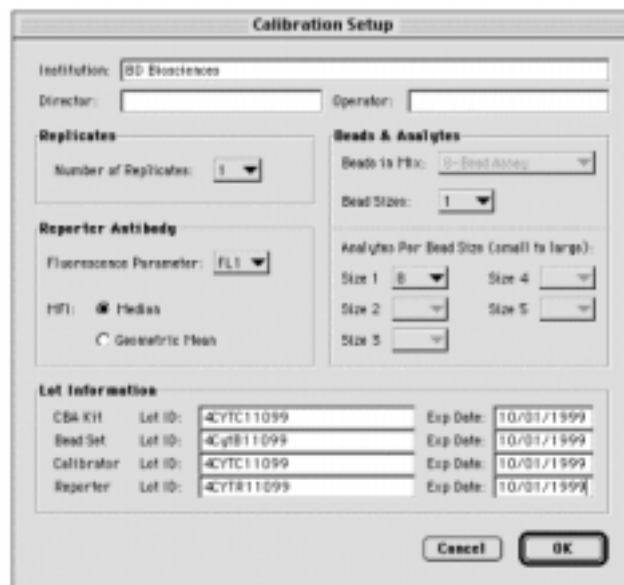
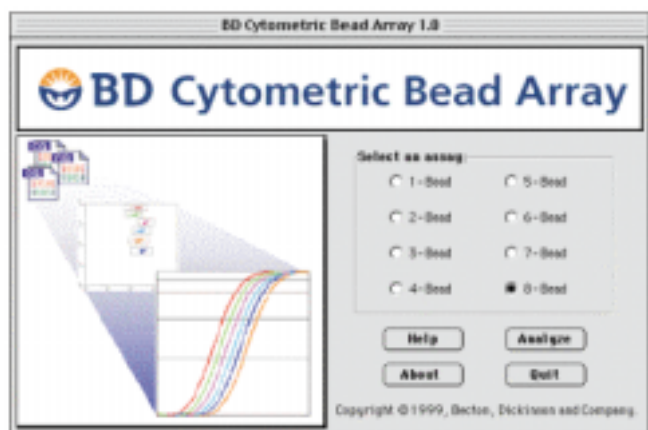


When the BD Cytometric Bead Array (CBA) Mouse Isotyping Kit (Cat. No. 04200K) was launched in May of 2000, a unique software product was simultaneously released. The Cytometric Bead Array (or Multiplex) Software, version 1.0, used Visual Basic for Applications (VBA) by Microsoft® to create a set of workbooks to provide users with qualitative identification of the mouse immunoglobulin isotypes present in an experimental sample¹. This was done by importing parameter data from user identified flow cytometry files, performing gating with a dedicated algorithm, calculating mean fluorescent intensity (MFI), and using those MFI's to determine a positive/negative result.

BD CBA Software v1.0 was also capable establishing a relationship between analyte concentration and fluorescence for quantitative assays in support of the launch of the Human Th1/Th2 Cytokine CBA assay (Cat. No. 550749) in September 2000². The BD CBA Software offered the ability to use 4, 6, or 8 bead assays in addition to various bead sizes to support expansion of the multiplex assay product family. Since the release of v1.0, there have been several changes in the computing environment such as a new version of Excel (2001) for the Macintosh computer, greater availability of Mac OS 9 and the G4 platform, a requirement to run on international Mac OS versions (Kanji, for example), and the need to perform Multiplex analysis on PC-based Windows 98 and Window NT® operating systems.

Table 1. BD CBA Software Compatibility

	Version 1.0	Version 1.1	Version 1.2
Excel 5	✓	✓	
Excel 98	✓	✓	
Excel 2000 (PC only)			✓
Excel 2001		✓	
OS 8.1 to OS 9	✓	✓	
Windows 98			✓
Window NT 4.10			✓
Mac PowerPC ≥ 7000	✓	✓	
Macintosh G3/G4	✓	✓	
PC			✓
International Mac OS versions		✓	



Accordingly, BD Biosciences' FACStation® CD version 3.4 (Cat. No. 348252) includes two new versions of BD CBA software to meet these demands. Version 1.1 adds compatibility with non-English Mac OS versions as well the ability to work with Excel 2001. Version 1.2 is designed specifically for the PC environment. This version allows seamless analysis of BD CBA assay files generated on flow cytometers that use a PC for instrument control and acquisition without the need for file conversion. The flexibility provided by these new BD CBA software versions will ensure that accurate and convenient results are calculated for a wide variety of situations ([Table 1](#)).

In addition to the ability to run in multiple software and computer environments, BD CBA Software Versions 1.1 and 1.2 offer expandability to accommodate custom multiplex analyte panels and future cytometric bead-based assays from Pharmingen. A variety of bead sizes and

intensities can be processed from files acquired on a wide range of flow cytometry platforms, fully exploiting the potential of multiplexed assays³.

References:

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3. Kricka, L.J. 1996. Simultaneous multianalyte immunoassays. In Immunoassay. Diamandis, E.P. and T.K. Christopoulos, eds. Academic Press. pp.389-404

NEW PerCP-Cy5.5 Reagents

A Trio of Options for Your Third Color in Flow Cytometry

By Florence Harrod, Ph.D. and Fariba Hosseini

PerCP-Cy5.5 joins Cy-Chrome™ and PerCP in the BD Biosciences reagent offering to give you three third-color choices for multicolor flow cytometry. Cy-Chrome is a tandem of R-Phycoerythrin (PE) and Cy5 that can be used along with Fluorescein (FITC) and PE on standard single-laser cytometers. Peridinin Chlorophyll-a Protein (PerCP) is a naturally occurring algal pigment that can be used as a third color on bench-top single- and dual-laser instruments. PerCP-Cy5.5 is a tandem of PerCP and Cy5.5 that can be used on single- and dual-laser bench-top and multi-laser stream-in-air research flow cytometers. The relevant features of the three fluorochromes for flow cytometry on bench-top and research flow cytometers are summarized in the table below.

The key advantages to using PerCP-Cy5.5-conjugated reagents is that they are useful for analysis on stream-in-air flow cytometers such as the BD FACSVantage™, it is not subject to photobleaching like PerCP, and it causes less Fc receptor-mediated non-specific staining than PE-Cy5 tandem fluorochromes.

It is important to note that there are several factors to consider when selecting a third-color fluorochrome for multi-color flow cytometric studies. These factors include appropriate selection of antibody fluorochrome, the type of instrument to be used (laser intensity and wavelengths), the density of the relevant antigen on the stained cells ("brighter" dyes are more useful for low-density antigens), and the presence of Fc receptors on the negative cell population. In addition, appropriate compensation controls should be used for multicolor studies. Finally, one should consider whether Allophycocyanin (APC)-conjugated reagents will also be used and whether the instrument is capable of cross-laser compensation.

Characteristics of Third-Color Fluorochromes

Features	Cy-Chrome (PE-Cy5)	PerCP*	PerCP-Cy5.5
Adsorption maximum	564 nm, 650 nm	490 nm	490 nm
Emission maximum	670 nm	677 nm	695 nm
Excitable by 488 nm laser?	Yes	Yes	Yes
Fc-mediated non-specific staining?	+++	-	-/+
Spectral overlap with PE	Minimal	Minimal	Minimal
Relative brightness on a BD FACSVantage	++++	+	++
Relative brightness on a BD FACSCalibur™ or BD LSR™	++++	++	+++
Sensitivity to visible light	Yes	Minimal	Minimal
Relative compensation required with APC channel	++++	++	+
Can be used with APC on dual-laser BD FACSCalibur?	Yes (requires significant cross-laser compensation)	Yes	Yes
Can be used with APC on dual-laser BD FACStar ^{plus} ™ or FACSVantage?	Only if cross-laser compensation is available	No, photobleaches	Yes†
Can be used with APC on three-laser BD LSR?	No	Yes	Maybe†

* PerCP-conjugated reagents are not recommended for use with laser power > 150 mW.

† Depending upon instrument settings, some PerCP-Cy5.5 signal may be detected in the APC channel and require cross-laser compensation. Cross-laser compensation is not available on the BD LSR flow cytometer.

Cy-Chrome, FACSVantage, FACSCalibur, LSR, and FACStar^{plus} are a trademarks of Becton, Dickinson, and Company.

PerCP is covered by US Patent No. 4,876,190.

Cy5.5 is covered by US Patent Nos. 5,268,486; 5,486,616; 5,569,587; 5,569,766; and 5,627,027.

NEW PerCP-Cy5.5 Reagents Now Available!

New PerCP-Cy5.5 Conjugated Antibodies

Anti-Mouse Antibodies from PharMingen

Cat. No.	New Cat. No.	Description	Clone	Size
0108TA	551163	CD3e (CD3 epsilon chain)	145-2C11	0.1mg
0106TA	550954	CD4 (L3T4)	RM4-5	0.1mg
0104TA	551162	CD8a (Ly-2)	53-6.7	0.1mg
0171TA	550993	CD11b (Mac-1 alpha chain)	M1/70	0.1mg
0965TA	551001	CD19	1D3	0.1mg
0998TA	551071	CD25 (IL-2 receptor alpha chain)	PC61	0.1mg
0111TA	550994	CD45 (LCA, Ly-5)	30-F11	0.1mg
0150TA	551113	CD69 (VEA Antigen)	H1.2F3	0.1mg
0208TA	550881	IgM	R6-60.2	0.1mg
1115TA	550763	Hamster IgG1, κ Isotype Control	A19-3	0.1mg
1114TA	550762	Hamster IgG2, λ Isotype Control	Ha4/8	0.1mg
0302TA	551115	Mouse IgG2a, κ Isotype Control	G155-178	0.1mg
1120TA	551072	Rat IgG1, λ Isotype Control	A110-1	0.1mg
1102TA	550765	Rat IgG2a, κ Isotype Control	R35-95	0.1mg
1118TA	550764	Rat IgG2b, κ Isotype Control	A95-1	0.1mg
Call for availability		Rat IgM Isotype Control	R4-22	0.1mg

Anti-Human Antibodies from BD Immunocytometry Systems*

RUO* Cat. No.	Product Description	Clone	Tests/vial
340949	CD3	SK7	50
341654	CD4	SK3	50
341649	CD9	M-L13	50
340951	CD19	SJ25C1	50
340955	CD20	L27	50
341650	CD33	P67.6	50
347203	CD34	8G12	50
340931	CD41a	HIP8	50
340953	CD45	2D1	50
341643	CD79a	HM47	50
347202	Mouse IgG ₁ Isotype Control	X40	50

*For research Use Only. Not for use in diagnostic procedures.

For Analyte Specific Reagents (ASR), please visit our website at www.bdfacs.com.

Related Reagents

Cat. No.	Product Description
345036	CalIBRITE PerCP-Cy5.5 Beads plus Buffer
345035	Bead Dilution Buffer

Procedure for 3-color Instrument Setup of BD FACScan and FACSCalibur Flow Cytometers for Analysis of Human Peripheral Blood Samples

By Judy Persona, Jennifer Evergin, and Jerry Wilson

BD Biosciences currently offers a number of support reagents for flow cytometry including CaliBRITE™ Beads and SPHERO™ particles (**Table 1**). These reagents are designed to facilitate instrument setup, fluorescence compensation and to check instrument sensitivity. The following three-part protocol describes the procedure used by the Quality Control Department at PharMingen for the performance, function verification, and instrument maintenance of their BD FACScan™ and FACSCalibur™ flow cytometers (BDIS, San Jose, CA). This protocol describes only 3-color instrument setup. Setup of the FACSCalibur for 4-color analysis will require additional steps and controls.

1.0 Materials and reagents

- 1.1 FACSComp™ software
- 1.2 CaliBRITE 3 Beads
- 1.3 SPHERO Rainbow Calibration Particles, 3.0 – 3.4 µm (Cat. No. 556286)
- 1.4 Isotonic buffered saline
- 1.5 Staining reagents for 3-color compensation sample:

Cat. No.	Clone	Format	Description
555366	RPA-T8	FITC	anti-human CD8
555347	RPA-T4	PE	anti-human CD4
555414	HIB-19	Cy-Chrome™	anti-human CD19

- 1.6 Staining reagents for 3-color isotype control sample:

Cat. No.	Clone	Format	Description
555748	MOPC-21	FITC	Mouse IgG1, κ isotype control
555749	MOPC-21	PE	Mouse IgG1, κ isotype control
555750	MOPC-21	Cy-Chrome	Mouse IgG1, κ isotype control

- 1.7 Human lysed whole blood
- 1.8 CellQuest™ Software

2.0 Instrument Setup using CaliBRITE Beads and FACSComp Software

Purpose: The CaliBRITE Beads and FACSComp software provide a useful tool for adjusting instrument settings, setting fluorescence compensation, and checking instrument sensitivity before analyzing cells. When used daily, they can be used to monitor instrument performance over time.

- 2.1 Prepare CaliBRITE 3 Beads according to package insert.
- 2.2 Launch the FACSComp software application.
- 2.3 Run FACSComp software in the Lyse/Wash mode.

Note: CaliBRITE Beads should be prepared daily.

3.0 Instrument Setup using SPHERO Rainbow Calibration Particles

Purpose: The SPHERO Rainbow Calibration particles allow the user to standardize the flow cytometer against cells stained in their laboratory. This procedure enables the user to setup the instrument consistently over time and can be used to standardize multiple instruments. By carefully monitoring the AMP/VOLT settings required to maintain the Target Values, the SPHERO Rainbow particles will enable the user to detect trends in instrument performance and possibly identify deterioration of instrument performance. Finally, this procedure will ensure that the samples acquired on the flow cytometer are setup against reproducible controls.

- 3.1 Prepare SPHERO Rainbow Calibration Particles by adding 3 drops of vortexed particles to 2 ml isotonic buffered saline.
- 3.2 Determine initial Target Values for SPHERO Rainbow Calibration particles.
 - 3.2.1 Prepare lysed whole blood sample stained with 3-color isotype control reagents.
 - 3.2.2 Launch CellQuest™ Software and connect to the flow cytometer. Turn compensation settings off.
 - 3.2.3 Create an analysis dot plot depicting FSC vs. SSC.

- 3.2.4 Create analysis histograms depicting FL1-, FL2-, and FL3-Height.
- 3.2.5 Run lysed whole blood sample stained with 3-color isotype control reagents.
- 3.2.6 Set a region around the lymphocyte cell population (**Figure 1a**) and apply that region gate to each of the histograms created in 3.2.4.
- 3.2.7 Adjust the voltage settings for FL1, FL2, and FL3 so that the negative lymphocyte population is within the first decade, being careful to center the mean within 10° and 10' (**Figure 1b**).
- 3.2.8 Run the SPHERO Rainbow particles prepared in 3.1 and acquire 10,000 events.
- 3.2.9 Analyze the data collected in 3.2.8 by setting a FSC vs. SSC region around the particle population and displaying gated histograms for the following parameters: FSC, SSC, FL1, FL2, and FL3. Set a marker around the particle peak.
- 3.2.10 Record the mean channel value for each parameter. These are now the Target Values for each parameter.

Note: It will be necessary to determine the Target Values for each lot of SPHERO particles used.

- 3.3 Perform daily calibration using SPHERO Rainbow Calibration particles.
 - 3.3.1 Launch CellQuest™ Software and connect to the flow cytometer. Turn compensation settings off.
 - 3.3.2 In setup mode, run the SPHERO Rainbow particles prepared in 3.1.
 - 3.3.3 Set a region around the particles and display gated histograms for FSC, SSC, FL1, FL2, and FL3.
 - 3.3.4 Set a marker around the particle peak on each histogram.
 - 3.3.5 Monitor the mean channel value of the particles for each parameter while adjusting the AMP gain for FSC and the VOLTS for SSC, FL1, FL2, and FL3 until the mean channel values are exactly the same as the Target Values determined in 3.2.

- 3.3.6 Once the mean channel values match the Target Values, exit setup mode. Run SPHERO Calibration particles until 10,000 events have been acquired. Save the data file.

Note: The CV of the particles should be monitored and acceptable ranges determined for your laboratory.

4.0 Setting 3-color compensation using stained cells:

Purpose: Because immunofluorescently stained leukocytes have different optical properties than most beads and particles, optimization of instrument compensation settings with cell samples is important. This compensation procedure will allow the user to adjust the compensation settings based on different immunophenotyping methods. It is important to note that the procedure described here is for the 3-color combination using FITC, PE and Cy-Chrome. Multiple fluorochrome combinations are possible for 3-color analysis using the FACScan and FACSCalibur flow cytometers and the fluorochrome-conjugated antibodies used to setup the instrument should match the fluorochromes used in your experiment.

- 4.1 Prepare 3-color compensation control sample.
 - 4.1.1 Prepare a single tube containing a lysed whole blood sample (100 µl) and stain with 20 µl of each 3-color compensation antibody reagent (see 1.5).
- 4.2 Set instrument compensation using 3-color compensation control sample.
 - 4.2.1 Create analysis dot plots depicting FSC vs. SSC, FL1 vs. FL2 and FL2 vs. FL3.
 - 4.2.2 In setup mode, run the 3-color compensation control sample.
 - 4.2.3 Set a region around the lymphocyte cell population in the FSC vs. SSC dot plot (**Figure 1a**).
 - 4.2.4 Apply the region gate to the dot plots depicting FL1 vs. FL2 and FL2 vs. FL3.
 - 4.2.5 The negative cell population should be located in the lower left corner of the FL1 vs. FL2 and FL2 vs. FL3 dot plots (**Figure 2**).

Procedure for 3-color Instrument Setup *(continued from page 13)*

- 4.2.6 Adjust the FL1 - %FL2 compensation setting until the FL1 mean fluorescence intensity (MFI) of the PE anti-CD4⁺ population is exactly equal to the FL1 MFI of the negative cell population.
- 4.2.7 Adjust the FL2 - %FL1 compensation setting until the FL2 MFI of the FITC anti-CD8⁺ population is exactly equal to the FL2 MFI of the negative cell population.

- 4.2.8 Adjust the FL2 - %FL3 compensation setting until the FL2 MFI of the Cy-Chrome anti-CD19⁺ population is exactly equal to the FL2 MFI of the negative population.
- 4.2.9 Adjust the FL3 - %FL2 compensation setting until the FL3 MFI of the PE anti-CD4⁺ population is exactly equal to the FL3 MFI of the negative cell population.

Note: For examples of properly compensated, undercompensated, and overcompensated data refer to [Figure 2](#).

Table 1.

CaliBRITE Beads:

Cat. No.	Product	Form	Tests
340486	CaliBRITE 3 IVD	Unlabeled, FITC, PE, PerCP	25
349502	CaliBRITE IVD	Unlabeled, FITC, PE	25
340497	CaliBRITE IVD	PerCP	25
340487	CaliBRITE IVD	APC	25

SPHERO Particles:

Cat. No.	Description	Size
556250	SPHERO Yellow Fluorescent Particles, 0.04 – 0.06 µm	2 ml
556251	SPHERO Yellow Fluorescent Particles, 0.7 – 0.9 µm	2 ml
556254	SPHERO UV, (low intensity) Fluorescent Particles, 1.7 – 2.2 µm	2 ml
556255	SPHERO UV, (high intensity) Fluorescent Particles, 1.7 – 2.2 µm	2 ml
556256	SPHERO Light Yellow, (low intensity) Fluorescent Particles, 1.7 – 2.2 µm	2 ml
556257	SPHERO Light Yellow, (high intensity) Fluorescent Particles, 1.7 – 2.2 µm	2 ml
556259	SPHERO Yellow, (high intensity) Fluorescent Particles, 1.7 – 2.2 µm	2 ml
556261	SPHERO Nile Red, (high intensity) Fluorescent Particles, 1.7 – 2.2 µm	2 ml
556268	SPHERO Yellow Fluorescent Particles, 2.5 – 4.5 µm	2 ml
556269	SPHERO Nile Red Fluorescent Particles, 2.5 – 4.5 µm	2 ml
556270	SPHERO Nile Blue Fluorescent Particles, 2.5 – 4.5 µm	2 ml
556276	SPHERO UV/Light Yellow Multiple Fluorophore Particles, 2.5 – 5.0 µm	2 ml
556286	SPHERO Rainbow Calibration Particles, 3.0 – 3.4 µm	5 ml
556288	SPHERO Rainbow Calibration Particles, 6.0 – 6.4 µm	5 ml
556291	SPHERO Rainbow Fluorescent Particle, 3.0 – 3.4 µm <i>(Brightest peak in 556286)</i>	5 ml
556293	SPHERO Blank Calibration Particles, 1.8 – 2.2 µm	5 ml
556294	SPHERO Blank Calibration Particles, 3.0 – 3.4 µm	5 ml
556296	SPHERO Blank Calibration Particles, 6.0 – 6.4 µm	5 ml
556298	SPHERO Rainbow Fluorescent Particle, 3.0 – 3.4 µm (mid-range FLI fluorescence)	5 ml
556300	SPHERO Rainbow Fluorescent Particle, 6.0 – 6.4 µm <i>(Brightest peak in 556288)</i>	5 ml
556303	SPHERO Nile Red Fluorescent Particle, 10 – 14 µm	2 ml
556304	SPHERO Yellow Fluorescent Particle, 15 – 19 µm	2 ml
556305	SPHERO Nile Red Fluorescent Particle, 15 – 19 µm	2 ml
559123	SPHERO Rainbow Calibration Particles (8 peaks), 3.0 – 3.4 µm	5 ml

Figure 1. Examples of lymphocyte gating and cellular autofluorescence.

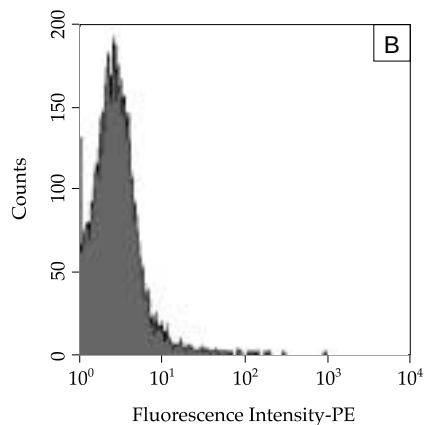
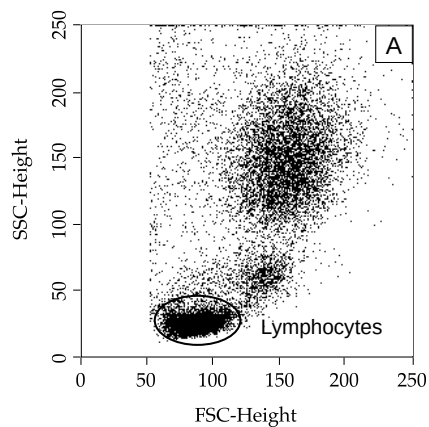
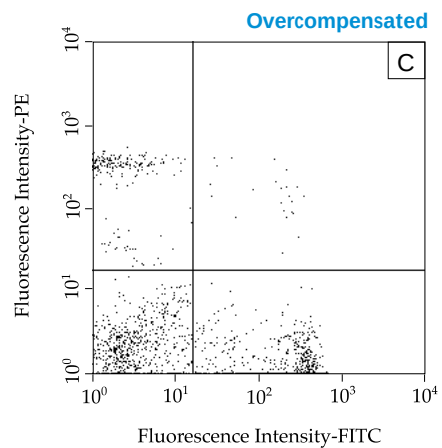
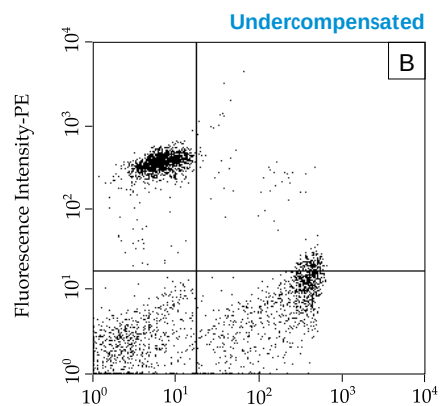
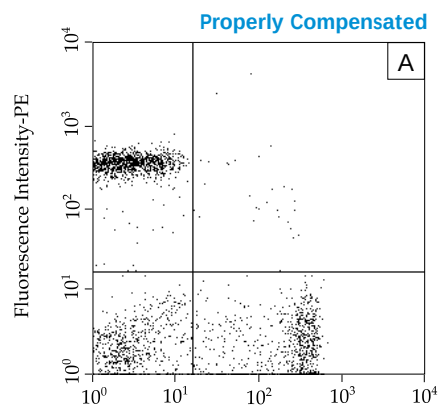


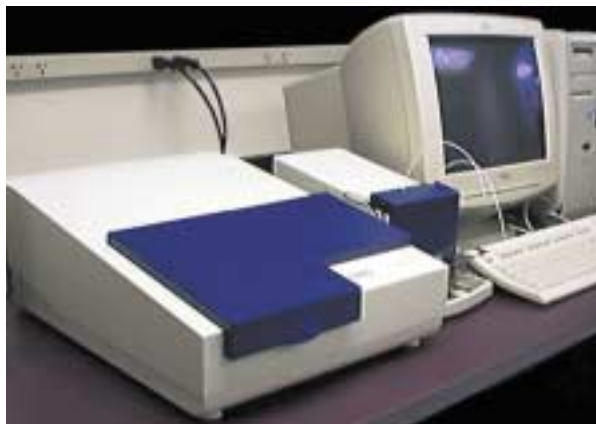
Figure 2. Examples of fluorescence compensation for multicolor analysis.



NEW Monolight 3096 Microplate Luminometer

By Susan Chambers

The Monolight 3096, an easy to use, ultra-sensitive, photon-counting luminometer, has been designed for the detection of bio- and chemiluminescence in microplate format. The instrument combines the latest, low-noise photomultiplier and state-of-the-art electronic circuitry to provide exquisite sensitivity and broad dynamic range. The injection unit complements the powerful system, which is capable of



performing virtually any injection and measurement protocol, with single or dual measurement modes, including luciferase reporter gene assays and ELISA's. The Monolight 3096 has the most flexible selection available for number of injections, delays between injections and measurements, and measurement times. The Monolight 3096 software runs on a MicroSoft® Windows® PC platform and allows automation of all steps from the definition of measurement parameters and addition of new protocols, to the reporting of final results. The data, reported as RLU's (relative light units), is displayed as it is collected, and is presented as a spreadsheet which may be saved and printed, or exported to Excel with a single mouseclick.

Applications:

All luminescent flash and glow-type assays can be performed on this instrument.

These include but are not limited to:

- Reporter Gene Assays, including Luciferase and β -gal
- ELISA-based Immunoassay
- PCR Quantification
- ATP Assays
- DNA Probe Assays
- Phagocyte Function Assays

Also available:

- Monolight 3010 Luminometer (tube format)
- Enhanced Luciferase Assay Kit and reagents
- OptEIA™ ELISA Sets, Kits and reagents, over 45 kits available for human, mouse and rat cytokines and chemokines

The Monolight 3096 Microplate Luminometer will be available from PharMingen in Spring, 2001.

Antibody Sampler Kits

With your research needs in mind, BD Biosciences Transduction Laboratories was the first to bring you Antibody Sampler Kits. Now, we offer an expanded selection of kits which provide a unique way to examine samples for multiple proteins of interest without the costs of purchasing individual antibodies from a variety of sources. We can also custom design a kit just for you.

Each Antibody Sampler Kit, comprised of multiple antibodies specific to a particular research focus, contains 10µg of each antibody plus the appropriate positive control lysates so that you can be assured of your Western blotting results. Antibody Sampler Kits enable you to analyze your samples with an array of antibodies to determine which proteins to target for further investigation. We are continuously expanding our line of sampler kits - visit www.translab.com for newly available products.

Sampler Kits now available:

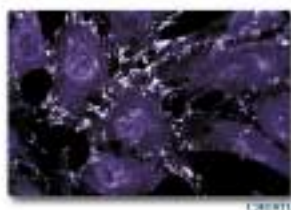
Cat. No.	Sampler Kit	Cat. No.	Sampler Kit
611418	Nuclear Transport	611436	Organelle
611419	MAP Kinase	611437	PKB/Akt
611420	PKA	611438	PTP
611421	PKC	611439	SH2 Proteins
611422	Stat	611440	SH3 Proteins I
611423	Cell Cycle I	611441	SH3 Proteins II
611430	Cycle II	611442	Stress Response
611424	Coated Vesicle	611443	Synaptic Vesicle I
611425	Ras Related	611444	Synaptic Vesicle II
611426	NOS	611445	Tumor Suppressor
611427	Apoptosis I	611446	Zonula Adherens
611428	Apoptosis II	611660	Axon Guidance
611429	Catalytic SH2	611661	B Cell Signaling
611431	Chaperone	611662	T Cell Signaling
611432	DNA Repair	611663	T Cell Signaling II
611433	Focal Adhesion	611665	NF-κB Related
611434	Golgi	611664	Non-Receptor PTK
611435	Integrins	611766	Caveolin

Apoptosis II Sampler Kit



Organelle Sampler Kit

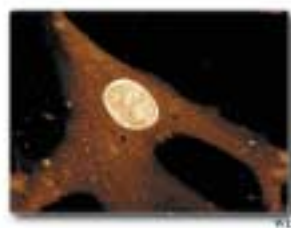
Focal Contacts



Golgi



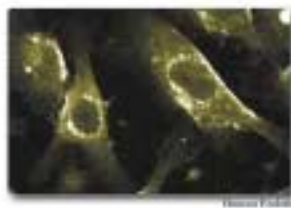
Nucleus



Endosomes



Caveolae



Mitochondria



Multiple Tissue Arrays (MTA)

By Padma Kodukula, Ph.D. and Joseph Volland, M.D.

With the completion of the human genome project, the need for high throughput screening of genes and their protein products is accelerating. DNA chips can be used to look at differential gene expression and for screening of mutations and 2D electrophoresis, antibody arrays and BD Biosciences' PowerBlot™ can be used to screen proteins. However, along with gene and protein analysis, there is often a need to go back to tissues to determine in which cell types a given protein is expressed.

To facilitate the high throughput screening of multiple tissues in many areas of biomedical research, BD Biosciences PharMingen is proud to announce a panel of multiple tissue arrays. Tissue arrays are available in the mouse, rat and human species allowing the researcher access to a variety of tissues on one convenient slide. The tissue arrays allow for high throughput screening by immunohistochemistry or *in situ* hybridization. They can also be used in the discovery of new molecules and proteins by studying their localization and expression in a complete panel of tissues. Our tissue arrays are made with formalin-fixed paraffin embedded tissue. Since formalin fixation can cause loss of reactivity with many antibodies, we have also constructed tissue arrays from tissues fixed in our specially formulated Zinc fixative. Zinc fixation is milder in action and alleviates some of the problems of epitope masking encountered with formalin. Zinc fixative provides better morphology than a frozen section and still preserves the antigenicity of a large number of cell markers (e.g. 80% of human CD markers and 75% of mouse CD markers tested are reactive with Zinc fixed paraffin embedded tissues). Arrays constructed from Zinc fixed material are particularly suited for high throughput

screening of monoclonal antibodies by immunohistochemistry. Our arrays contain 24 tissues in duplicate. The major organs are represented, and the tissue spots are 1.5 mm in diameter to provide good preservation of histologic structure. The tissue arrays can be utilized with any immunohistochemistry or *in situ* hybridization reagents including our expanded portfolio of over 250 primary antibodies, secondary antibodies, and detection systems. Refer to **figures 1 and 2** for some examples.

Characteristics of the tissue arrays:

- Available in the mouse, rat and human species.
- 24 major organs each represented in duplicate.
- Each tissue spot is 1.5 mm in diameter to depict good morphological detail.
- Formalin-fixed and Zinc-fixed paraffin embedded tissue.

Applications of the tissue arrays:

- Any slide based protein or nucleic acid detection.
- High throughput capacity for preliminary screening.
- Difficult to obtain tissues all in one slide for easy use and comparison.
- Applicable with any IHC or In-situ hybridization reagents including our portfolio of over 250 antibodies, antigen retrieval solutions and detection systems.

Cat. No.	New Cat. No.	Product Description
7612NT	551253	Human normal MTA (Formalin-fixed)
7613NT	551255	Human normal MTA (Zinc-fixed)
7614NT	551257	Lewis Rat normal MTA (Formalin-fixed)
7615NT	551259	Lewis Rat normal MTA (Zinc-fixed)
7616NT	551260	BALB/c Mouse normal MTA (Formalin-fixed)
7617NT	551261	BALB/c Mouse normal MTA (Zinc-fixed)

All IHC products are for research use only.

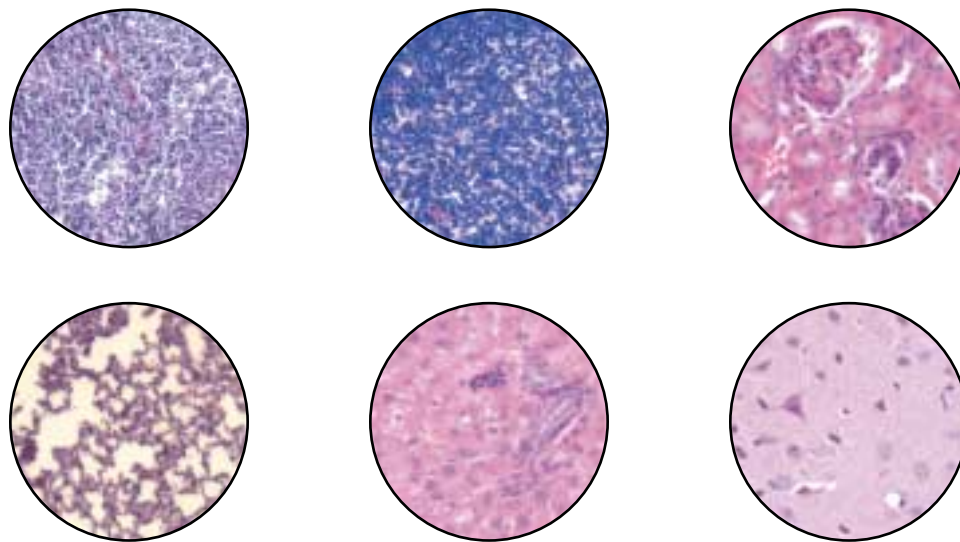


Figure 1. Haematoxylin and Eosin staining of mouse tissue array. Formalin-fixed paraffin sections of BALB/c mouse normal multiple tissue array were stained with haematoxylin and eosin to study morphological detail of the tissues. Shown from left to right, top to bottom are spleen, thymus, kidney, lung, liver and brain.

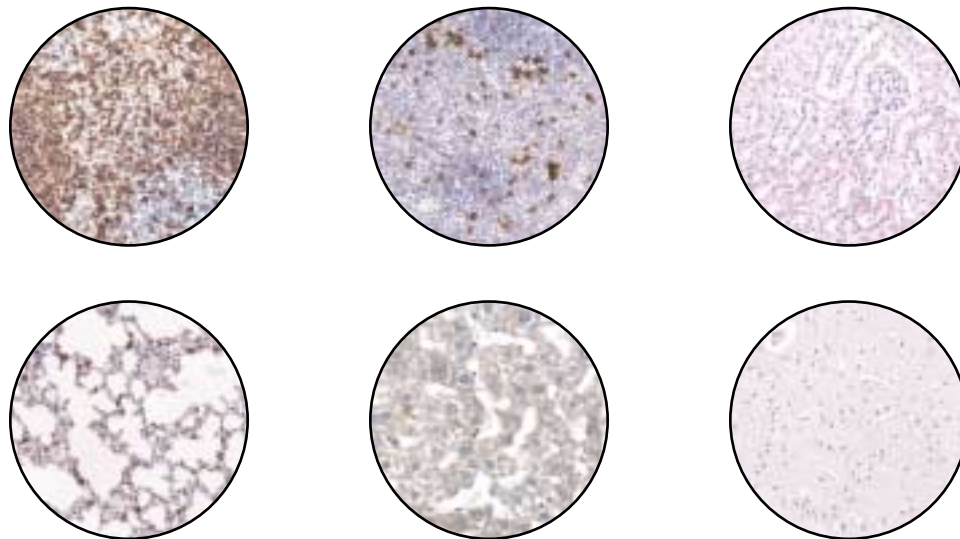
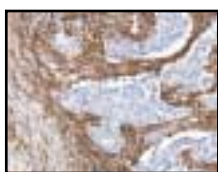


Figure 2. CD45 immunostaining of mouse tissue array. Formalin-fixed paraffin sections of BALB/c mouse normal multiple tissue array were stained with antibody against mouse CD45 to study the distribution of leukocytes in the different tissues. Positive staining can be seen by the intense brown labeling of cells in the spleen, thymus and lung. Shown from left to right, top to bottom are spleen, thymus, kidney, lung, liver and brain.

IHC in Many Colors

Padma Kodukula, Ph.D. and Joseph Volland, M.D



DAB



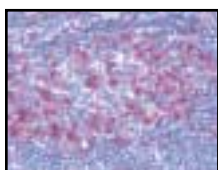
DAB - Orange*



TMB*



BCIP/NBT



Fast-Red



DAB - Black*



AEC



New Fuchsin



BCIP/INT*

Immunohistochemistry utilizes antibodies to probe for antigens in tissue sections or cells preparations on a slide. The purified primary antibody is reacted with a biotinylated secondary antibody and, for good amplification and increased sensitivity, the signal is then detected using streptavidin-horseradish peroxidase or -alkaline phosphatase.

In the presence of hydrogen peroxide, the enzyme horseradish peroxidase catalyses an oxidative reaction converting a substrate into a dye polymer that can be visualized under the light microscope. Alkaline Phosphatase, on the other hand, mediates dephosphorylation of its colorless substrate converting it into a visual precipitate. Horseradish peroxidase functions at a faster catalytic rate and thus the sensitivity of the reaction is greater than when using alkaline phosphatase. Alkaline phosphatase exhibits a slower reaction rate but it can be maintained linear over a longer period of time and the known substrates for alkaline phosphatase are less toxic. Pharmingen offers both these enzyme detection systems—Streptavidin-Horseradish peroxidase (Cat. No. 550946/75477E) and Streptavidin-Alkaline phosphatase (Cat. No. 551008/75893E) in a pre-diluted format.

To complement the enzyme detection systems, we offer a complete panel of chromogenic substrates in a range of colors. Diaminobenzidine (DAB) is the commonly used amine substrate for horseradish peroxidase. It produces a characteristic brown oxidation product and heavy metals like nickel and cobalt can be added to DAB to change the color of the end product. Fast-Red, New Fuchsin, BCIP are substrates for alkaline phosphatase all producing different end color products. Important characteristics of these substrates are listed below. Two or more of these substrates can be used together to perform multi-color immunostaining of multiple antigens simultaneously.

Substrate	Enzyme	Solubility (Alcohol & Xylene)	End color product
DAB	HRP	Insoluble	Reddish brown
DAB-Black*	HRP	Insoluble	Black
DAB-Orange*	HRP	Insoluble	Orange-Red
AEC	HRP	Soluble	Red
TMB*	HRP	Insoluble	Blue
New Fuchsin	AKP	Insoluble	Intense Red / Fuchsia
BCIP/NBT	AKP	Soluble	Purple
BCIP/INT*	AKP	Soluble	Brown
Fast-Red	AKP	Soluble	Bright Red

* Call for availability
All IHC products are for research use only.

Cell and Tissue Lysates

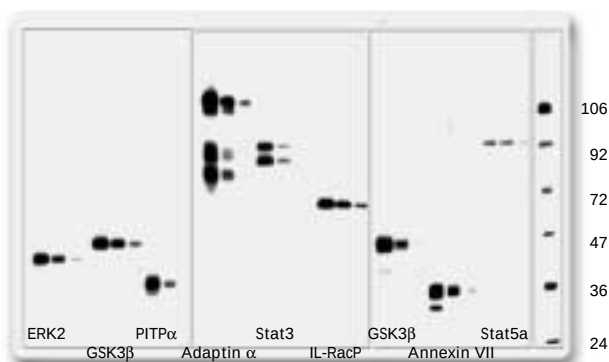
BD Biosciences Transduction Laboratories has expanded its lysate program to provide researchers with a simple and effective control for Western blotting experiments. As well as human, rat and mouse cell and tissue lysates, we have added many untreated and treated lysates to use as positive controls with phospho- and active caspase-specific antibodies.

Cell Lysates

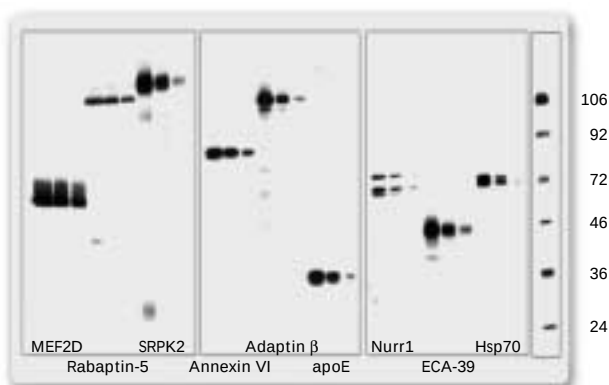
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611447	A431	611639	Rat Embryonic Brain
611448	A431+EGF	611686	Rat Embryonic Heart
611903	A-498	611687	Rat Embryonic Kidney
611631	BC3H1	611688	Rat Embryonic Liver
611685	CHO-K1	611689	Rat Embryonic Lung
611546	EB1	611690	Rat Embryonic Tissue Kit
611633	F9	611545	Rat (Adult) Tissue Kit
611547	FHs 738Lu	611683	Mouse Cerebellum
611474	HCT-8	611455	Mouse Cerebrum
611674	HE+IL-4 control (0h)	611456	Mouse Heart
611675	HE+IL-4 (1h)	611457	Mouse Kidney
611666	HE+pervanadate control	611458	Mouse Liver
616667	HE+pervanadate	611459	Mouse Lung
611449	HeLa	611460	Mouse Muscle
611477	HeLa+CoCl ₂	611672	Mouse Neonate
611555	HepG2	611461	Mouse Ovary
611549	HL-60	611462	Mouse Spleen
611450	Human Endothelial	611544	Mouse Tissue Kit
611679	JAR	611452	NIH 3T3
611451	Jurkat	611454	PC12
611626	Jurkat+Staurosporine Kit	611636	Rat Adrenal
611627	Jurkat Staurosporine Ctrl (0h)	611699	Rat Bone Marrow
611628	Jurkat+Staurosporine (1h)	611464	Rat Cerebellum
611629	Jurkat+Staurosporine (4h)	611463	Rat Cerebrum
611630	Jurkat+Staurosporine (8h)	611680	Rat Eye
611550	K-562	611465	Rat Heart
611548	MCF7	611466	Rat Kidney
611634	MDBK	611467	Rat Liver
611635	MDCK	611468	Rat Lung
611554	MOLT-3	611469	Rat Muscle
611479	Mouse Macrophage	611470	Rat Ovary
611473	Mouse Macrophage+ IFN γ /LPS	611637	Rat Pancreas
611552	NRK	611638	Rat Peripheral Nerve
611673	P19	611471	Rat Spleen
611478	SL-29	611472	Rat Testis
611475	SW-13	611553	Rat Thymus
611551	THP-1	611753	Rat Tongue
611765	U-373	611698	Rat Uterus
611764	U-87	611453	RSV-3T3
611476	WI-38		

Tissue Lysates

Mouse Tissue Lysates



Human Cell Lysates



Mouse Dendritic Cells

By Ravi Hingorani, Ph.D.

Dendritic cells (DCs) are among the most efficient of antigen presenting cells (APC) that regulate the immune system ^{1,2}. DC precursors migrate to both the lymphoid and non-lymphoid tissues from the bone marrow where they exert a sentinel-like function. Upon acquiring a “maturation/danger” signal in non-lymphoid tissue like skin and lung, immature DCs migrate to secondary lymphoid organs (**Figure 1**). Maturation signals include tissue damage by pathogens and T-cell stimulation via cytokines in cases of inflammation. Immature DCs, such as Langerhans cells in the skin, have high cell surface expressions of receptors capable of capturing antigens for uptake and processing ^{3,4}. In contrast, the mature DCs in secondary lymphoid tissues, such as lymph nodes and spleen, have a lower capacity to capture antigens, but are extremely efficient in the stimulation of naïve T cells.

Maturation and migration of DCs increases cell surface expression of MHC class II as well as co-stimulatory molecules such as CD80, CD86 and CD40. High expression of peptide loaded MHC class II activates the T cells through the T cell receptor while CD80 and CD86 co-stimulate via the CD28 pathway ⁵. In turn, T cells activate the DCs through the CD40-CD40L interaction to produce cytokines such as IL-12 ⁶. Evidence suggests that certain mouse DCs (CD8 α ⁺) direct the T-cells to a Th1 type of response while others (CD8 α ⁻) direct the T cells to a Th2 type of response ⁷. Thus, the environment in which the DC has been stimulated, as well as the type of stimulus, plays an integral role in the fate of the T-cell response.

Dendritic Cell Heterogeneity:

The lack of highly specific markers for DCs and their extremely low numbers in the peripheral tissues have made them difficult to characterize. This is compounded by the fact that, due to their high endocytic and adherent functions, some markers may simply be “picked up” by internalization of other cells or tightly associated non-DCs⁸. Recent advances in techniques for isolation and tissue culture of DCs have helped solve some of these questions.

Freshly isolated DCs from mouse spleen have been separated into three subsets depending on their surface expression of CD4, CD8 ($\alpha\alpha$), CD11b and DEC-205 ⁸. Cells expressing high levels of CD11b are of myeloid origin while the cells that are low or negative for CD11b are of lymphoid origin. Mouse DCs expressing CD8 ($\alpha\alpha$) and DEC-205 with low or negative expression of CD11b are of lymphoid lineage (CD8 α ⁺ DEC-205⁺ CD11b⁻). The DCs from the myeloid lineage are described as negative for CD8 ($\alpha\alpha$), low or negative for DEC-205 and positive for CD11b. However, a recent report suggests that some CD8 ($\alpha\alpha$) DCs can also be derived from myeloid progenitors ⁹. The myeloid lineage is further divided into two subsets depending on the expression or absence of CD4: CD4⁺ DEC-205⁻ CD11b⁺ and CD4⁻ DEC-205⁻ CD11b⁺ ¹⁰.

The three subsets of splenic DCs are considered to be products of distinct DC lineages rather than different maturation steps ^{8,10}. This is based on several findings:

- All three subsets have high expression of MHC class II, CD40, CD80 and CD86 (indicative of a fully mature phenotype) and can effectively stimulate T cells.
- In vitro* culture of one population of DC does not cause maturation into another, indicating the relative stability of the basic phenotype.
- Removal of the CD4-positive DCs in anti-CD4 transgenic mice does not change or affect the other two subsets.
- Continuous BrdU-labeling studies show no sign of precursor-product relationship between the DC subsets.

With the success of DC cultures, distinct subsets are being further described. Such subsets include bone marrow derived DCs (BMDC), monocyte derived DCs (MODC), lymphoid derived DCs, plasmacytoid DCs, and germinal center DCs ¹ (**Figure 2**). Whether they form the actual pool of *in vivo* DCs is under investigation. A short summary of markers used for identifying different subsets of mouse dendritic cells is given in **Table 1** ¹¹.

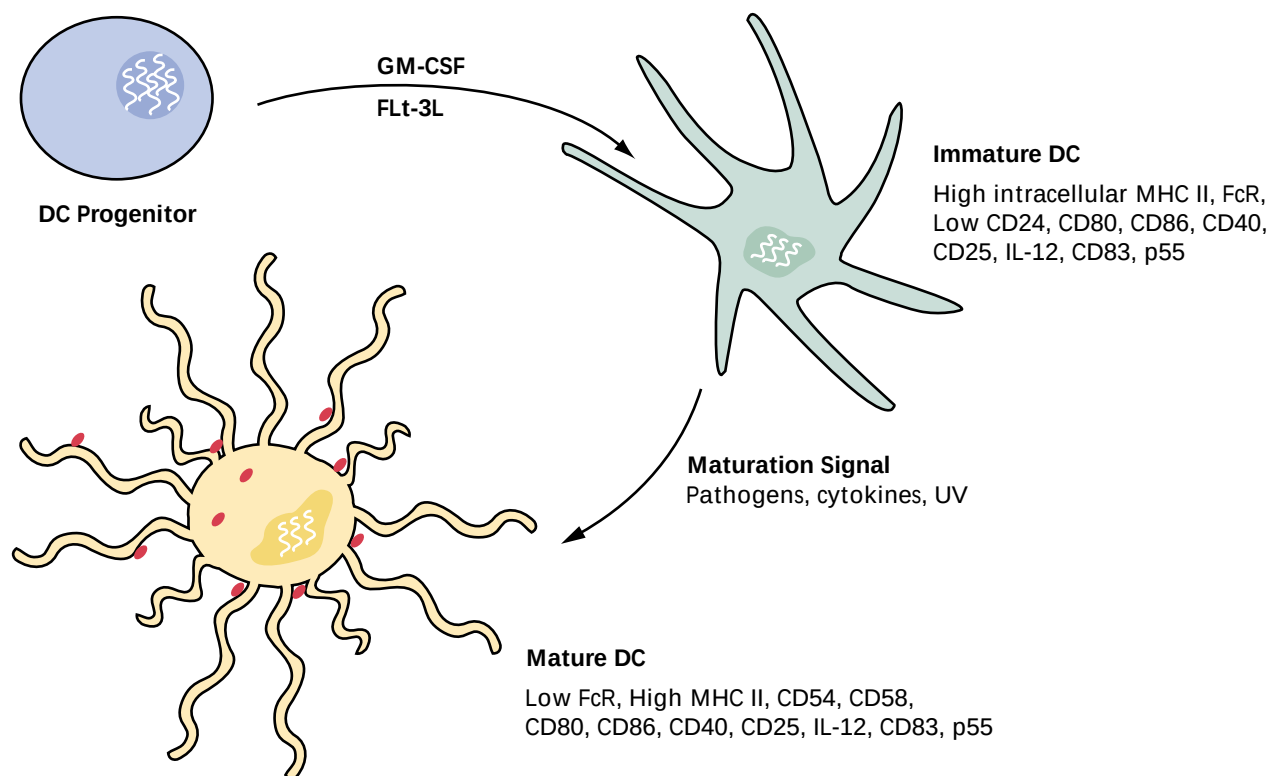
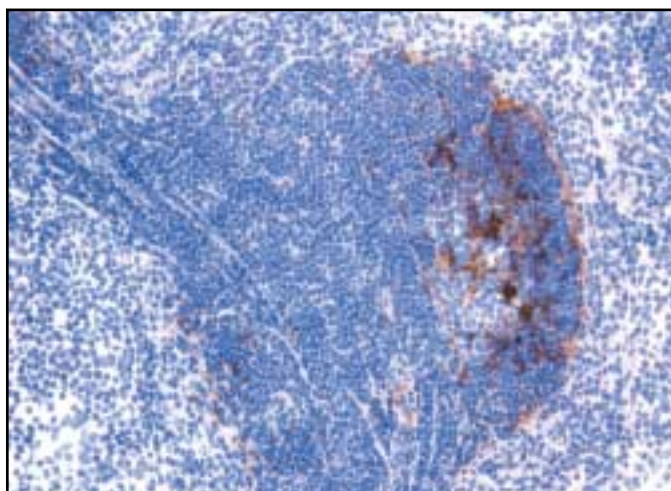


Figure 1. Maturation of dendritic cells. Dendritic cell (DC) progenitors from the bone marrow migrate to lymphoid and non-lymphoid tissues where they respond to maturation signals to fully develop. Maturation of DCs from "immature" to the "mature" stage involves changes in surface expression of antigens involved in antigen presentation and stimulation.

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Mouse Dendritic Cells *(continued from page 23)*



Magnification 20X

Figure 2. Immunohistochemical staining for mouse follicular dendritic cells. Frozen sections of normal mouse spleen were stained with the FDC-M1 antibody (*call for availability*) specific for dendritic cells. Follicular dendritic cells in the germinal center can be identified by the intense brown labeling of their cell membranes.

Table 1. Expression of Cell Surface Markers on Myeloid and Lymphoid Derived Mouse Spleen Dendritic Cells

Surface marker	Myeloid DC (spl.)	Lymphoid DC (spl.)
CD1d	No	Yes
CD4	Yes	No
CD8a	No	Yes
CD9	Yes	Yes
CD11a	Yes	Yes
CD11b	Yes	dim/neg
CD11c	Yes	Yes
CD13	Yes	Yes
CD23	No	Yes
CD24	Yes/low	Yes
CD44	Yes	Yes
CD54	Yes	Yes
CD80	Low	Low
CD86	Yes	Low
CD102	Yes	Yes
MHC Class I	Yes	Yes
MHC Class II	Yes	Yes
DEC-205	low	Yes

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Phosphorylation of the Gap Junction Protein, Connexin 43

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Introduction

Gap junctions are a unique type of intercellular junction found in most animal cell types. They form aqueous channels that interconnect the cytoplasms of adjacent cells and enable the direct intercellular exchange of small cytoplasmic components (≤ 1000 daltons)^{1,2}. Gap junctions are created across the intervening extracellular space by the docking of two hemichannels contributed by each adjacent cell³. Each hemichannel is an oligomer of six connexin (Cx) molecules, thus the complete gap junction represents a dodecameric complex³. The transmembrane connexin protein possesses four hydrophobic membrane-spanning domains, two extracellular domains involved in docking, and three cytoplasmic domains corresponding to the amino-(N) terminal region, a loop between transmembrane domains 2 and 3, and the carboxy-(C) terminal tail region^{3,4}.

Connexin43 (Cx43) was the second connexin gene discovered⁵ and it encodes one of the most widely expressed connexins in established cell lines and tissues. Gap junctions formed by Cx43 have been implicated in development, cardiac function, and growth control^{6,7}. This brief review will focus on selected, recent work which attempt to understand the regulation of the "gating" of Cx43 gap junction channels through the phosphorylation of Cx43 by serine and tyrosine protein kinases. Comprehensive reviews on the effects of serine protein kinases or receptor and non-receptor tyrosine protein kinases on Cx43 processing (trafficking, assembly, localization, and degradation) and function have been published recently⁸⁻¹⁰.

Cx43 from unstimulated cells is phosphorylated primarily on multiple serine residues, but minor amounts of threonine have been detected¹¹⁻¹³. Cx43 is also phosphorylated on tyrosine in neoplastically-transformed cells that express

activated tyrosine kinases such as the v-Src (pp60^{v-src}) or the v-Fps (p130^{gag-fps}) oncoproteins¹⁴. The exact number of phosphorylated sites is not known, however, each phosphorylated Cx43 molecule from unstimulated cells must contain at least one phosphoserine residue because phosphatase treatment converts all of the Cx43 phosphoisoforms (radiolabeled with ³⁵S) to the nonphosphorylated form¹¹. Moreover, immune depletion experiments have suggested that each phosphorylated Cx43 molecule in v-Src-transformed cells contains at least one phosphoserine and phosphotyrosine residue¹².

In unstimulated cells, the protein kinase(s) responsible for phosphorylating Cx43 or the site(s) targeted are unknown. In stimulated cells, the protein kinases that appear to phosphorylate Cx43 directly *in vitro* and *in vivo*, include protein kinase C (PKC) induced by the tumor promoter, TPA^{15,16}, MAP kinase induced by EGF^{17,18}, and the activated pp60^{src} kinase^{13,19}. For the most part, phosphorylation induced on Cx43 by these agents on serine or tyrosine is associated with the transient or prolonged disruption of gap junctional communication.

Phosphorylation of Cx43 by protein kinase C

TPA-induced phosphorylation of Cx43 is often associated with the marked and prolonged disruption of gap junctional communication²⁰⁻²³. Recent studies have demonstrated that PKC can phosphorylate Cx43 on S368 and S372 *in vitro*^{15,16}. Moreover, analysis of Cx43 phosphorylated *in vitro* by purified PKC or endogenously in TPA-treated cells indicated that S368 is a major *in vivo* site of phosphorylation¹⁶. Importantly, dye transfer between cells expressing a site-directed S368A Cx43 mutant was resistant to disruption by TPA, compared to cells containing wild-type Cx43, where dye transfer was markedly inhibited. Analysis of single gap junction channels showed a TPA-dependent increase in the relative frequency of a ~50 pico Siemen (pS) channel population and a concomitant decrease of the ~100 pS channel population in cells expressing wild type Cx43, while cells expressing the S368A mutant Cx43 showed no loss in the ~100 pS channel population in response to TPA¹⁶. Thus, phosphorylation of Cx43 on S368 decreased the number of cells

Phosphorylation of Connexin43 (continued from page 25)

transferring dye, enhanced the relative frequency of a lower conductance state (~50 pS), and diminished the relative frequency of the full open state (~100 pS). These data strongly supported the conclusion that the PKC-mediated phosphorylation of S368 in Cx43 is one major mechanism by which the TPA tumor promoter disrupts gap junctional communication and may contribute to the development of the neoplastic transformed phenotype.

Phosphorylation of Cx43 by Receptor Tyrosine Kinases

Activation of the EGF and PDGF receptor tyrosine kinases by ligand binding results in the transient disruption of gap junctional communication, concomitant with the marked increase in the phosphorylation of Cx43²⁴⁻²⁷. These effects of EGF on Cx43 occurred independently of observable changes in gap junction plaques²⁵. EGF-induced disruption of intercellular communication was followed by a slow recovery of communication and the dephosphorylation of Cx43²⁵. Okadaic acid, an inhibitor of protein phosphatases PP1 and PP2A, retarded not only the restoration of gap junctional communication, but also the dephosphorylation of Cx43 after EGF treatment, suggesting a role for protein phosphatases in the regulation of Cx43 function²⁶.

The increased phosphorylation of Cx43 was restricted to serine amino acids, indicating that the activated EGF receptor did not phosphorylate Cx43 directly, but instead, induced the activation of a downstream serine protein kinase. Further studies showed that EGF-induced disruption of Cx43 function was independent of PKC activity, but was dependent upon the activation of the downstream mitogen-activated protein (MAP) kinase²⁶. S255, S279, and S282 were targeted by the activated MAP kinase in *in vitro* kinase reactions and *in vivo*^{17-18,26}. A triple phosphorylation site Cx43 mutant (S255A,S279A,S282A), introduced into cells lacking wild type Cx43, retained the ability to establish functional gap junctions, but, interestingly, was resistant to the disruptive effects of MAP kinase activated by the EGF receptor¹⁸. In a distinctly different experimental approach, Cx43 channels reconstituted into lipid vesicles were phosphorylated by purified MAP kinase which resulted in the reduction in the permeability of

liposomes²⁸. These data confirmed Cx43 and, particularly these three serine sites, as targets of EGF-activated MAP kinase *in vivo* and supported the concept that phosphorylation of these sites was sufficient for the ability of the activated EGF receptor to disrupt gap junctional communication.

The disruption of gap junctional communication by the activated PDGF receptor appears to be more complex because both PKC and MAPK were reported to be necessary for the disruption of Cx43 activity²⁹. In addition, more recent reports suggested that the PDGF-induced disruption of Cx43 function did not rely solely on phosphorylation of Cx43 or activation of MAP kinase, but may require additional signaling pathways^{30,31}. The sites of serine phosphorylation induced by the activated PDGF receptor and the responsible downstream serine protein kinase(s) that may phosphorylate Cx43 directly have not been identified. Clearly, additional studies are necessary to clarify the mechanism of action of the activated PDGF receptor on Cx43 function.

Phosphorylation of Cx43 by Non-Receptor Tyrosine Kinases

A number of laboratories have shown that when a non-receptor tyrosine kinase, such as pp60^{src}, is active, Cx43 is phosphorylated on tyrosine residues and intercellular junctional communication is inhibited^{11,12,32-34}. The v-Src tyrosine kinase appeared to phosphorylate Cx43 directly *in vitro* and *in vivo*^{19,34}. Cx43 not only co-localized with the v-Src tyrosine kinase to plasma membrane regions of the cell³⁵, but also appeared to interact directly with v-Src¹³. This molecular association was dependent upon interactions between putative proline-rich and phosphotyrosine sites in Cx43 and the SH3 and SH2 domains in v-Src, respectively¹³. A possible model for this interaction hypothesizes that the SH3 domain of v-Src may bind initially to a proline-rich region in Cx43 (P274-P284) which permits the close approximation of the kinase domain to Y265 of Cx43. Phosphorylation of Y265 may stabilize binding through an SH2:phospho-Y265 interaction, which in turn may lead to the phosphorylation of additional tyrosine site(s) (Y247?) on Cx43 by v-Src (and/or serine sites may be phosphorylated by a putative associated

serine kinase). The direct phosphorylation at one or more of these Cx43 tyrosine sites by v-Src may be responsible for the observed disruption of gap junctional communication.

Y265 in Cx43 is one critical site that appears to be targeted by the v-Src kinase^{13,34}. Importantly, a Y265F site-directed mutant of Cx43 produced functional gap junction channels in *Xenopus* oocytes that were no longer affected by the presence of active pp60^{src} kinase³⁴. In addition, this Y265F Cx43 mutant failed to interact with, and was no longer phosphorylated by, the v-Src kinase¹³. These data suggested that the phosphorylation of Y265 is required for v-Src to disrupt gap junctional communication established by Cx43.

Recent work has challenged this developing story of the regulation of Cx43 channel activity by v-Src³⁶. In this work, junctional conductance established by a similar Y265F site-directed Cx43 mutant in paired *Xenopus* oocytes, was disrupted by v-Src³⁶. Moreover, the MEK inhibitor, PD98059, blocked the ability of v-Src to disrupt gap junctional communication in paired oocytes, suggesting that phosphorylation of Cx43 on serine, not tyrosine, by an enzyme, such as MAP kinase, may be involved in v-Src's action³⁶. The effects of v-Src on a Cx43 mutant lacking both phosphotyrosine sites (targeted by v-Src) and the phosphoserine sites (targeted by MAP kinase) were not reported. At the present time, a thorough explanation that reconciles these differences in experimental results remains a desired goal in the field.

Conclusions

Currently available data strongly endorse a significant role for phosphorylation in the regulation of Cx43 gating function and suggest several key conclusions and working hypotheses that will help guide future explorations. First, in several illustrations, phosphorylation of specific serine sites (*e.g.* S368 by PKC and S255, S279, and S282 by MAP kinase) or a tyrosine site (*e.g.* Y265 by v-Src) in Cx43 resulted in the attenuation of gap junctional communication, independently of alterations in Cx43 localized to gap junction plaques at the plasma membrane. Hence, this effect apparently involved the "gating" of gap junction channel activity. Further work is clearly required

to settle critical, contested aspects of this model, and to establish in mechanistic terms, how phosphorylation of connexins actually elicits the "closure" of gap junction channels. Second, phosphorylation of Cx43 may create a specific binding site that promotes the interaction with a domain that governs protein-protein interactions (*e.g.* the interaction between phospho-Y265 in Cx43 and the SH2 domain of v-Src). Such domain-driven interactions may represent novel means of regulating Cx43 function that so far has been inadequately investigated. Third, the effects of phosphatase inhibitors on phosphorylated Cx43 evoke the critical importance of exploring "Cx43 phosphatases" in the future.

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Characterization of Armenian Hamster Ig Heavy Chain & Light Chain Subclasses

By Qiling Sun, M.D.

Monoclonal antibodies (mAbs) from the Armenian hamster, *Cricetulus migratorius*, have been widely utilized for defining cell surface antigens, lymphocyte activation, signal transduction, and apoptosis, etc. In contrast to the popularity of their applications, however, little is known about the genetics and structure of Armenian hamster IgG isotypes. This is in part due to the fact that Armenian hamster isotype-specific mAbs or polyclonal antisera are not widely available¹ and heavy and light chain gene sequence data is very limited²⁻⁴. In order to develop hamster Ig isotype-specific second step reagents for detecting hamster primary antibodies and to define Armenian hamster Ig isotype classes, PharMingen assembled a panel of mouse mAbs specific to hamster IgG, IgM, κ - and λ -light chain subclasses.

Monoclonal antibodies to hamster IgG heavy chain:

Seven anti-Armenian hamster IgG mAbs (G94-56, HIG-632, G192-1, G70-204, HIG-88, G94-90.5 and HIG-65) were tested against 77 hamster IgG mAbs (71 Armenian hamster and 6 Syrian hamster IgG clones), hamster serum and IgG Fc and Fab fragments by ELISA. The antibodies were further evaluated by competitive inhibition and epitope cross-blocking assays. The results showed that each mAb reacted with some but not all hamster IgG mAbs. MAb G94-56, HIG-632, G94-90.5 and G192-1 reacted with both Armenian and Syrian hamster IgG. The other three mAbs (HIG-65, G70-204 and HIG-88) reacted only with Armenian hamster IgG. In western blot analysis, with the exception of G192-1, all mAbs bound to IgG heavy chain. These results demonstrated that each mAb recognizes a distinct determinant on the IgG molecules and that the mAbs G94-56, HIG-65, G70-204, G192-1 define four unique isotypic determinants on Armenian hamster IgG. Based upon the reactive patterns as shown in [Table 1](#), we have classified Armenian hamster IgG heavy chains into four subclasses: IgG1, 2, 3, and 4. In the PharMingen 2000 catalog these were designated IgG

groups 1-4. For details of the isotype classifications of the 79 different hamster primary antibodies, please visit www.pharmingen.com.

Although this nomenclature of Armenian hamster IgG subclasses is based upon serological data and needs to be eventually confirmed by identification of individual IgG genes, the classification of IgG subclasses is particularly useful for researchers in simplifying selection of proper second step reagents to detect Armenian hamster primary antibodies in various immunoassays. PharMingen offers an extensive line of Armenian hamster Ig isotype controls and mAbs that react with every known Armenian hamster IgG.

Monoclonal antibodies to hamster IgM heavy chains:

Two mAbs (G188-2 and G188-9) reacted with Armenian hamster IgM heavy chain Fc region. While G188-2 reacted specifically with Armenian hamster IgM, G188-9 also cross-reacted with Syrian hamster IgM and rat IgM. Furthermore, mAbs G188-2 and G188-9 stained about 55% of hamster spleen cells by immunofluorescent staining with flow cytometric analysis.

Monoclonal antibodies to hamster Ig light chains:

Four anti-hamster Ig light chain mAbs (HIG-29, G188-1, G192-2 and HIG-346) were evaluated. The light chain specificity of these antibodies was confirmed by western blot and immunofluorescent analysis of splenocytes. The reactivity of HIG-29 and G188-1 also corresponds to that of RG7/7.6, an anti-rat κ -light chain antibody that cross-reacts with hamster κ -light chain⁵. These results suggest that the mAbs⁵ HIG-29 and G188-1 are hamster κ -light chain specific. The mAbs G192-2 and HIG-346 are λ chain specific, since they do not react with any known κ -positive mAbs. Given that mAb G192-2 cross-reacts with Syrian hamster λ -light chain we have designated it as anti-hamster λ 1 and mAb HIG-346 is designated as anti-Armenian hamster λ 2-light chain. Interestingly some Armenian hamster Ig molecules do not react with any of our anti-light chain mAbs suggesting the existence of a fourth, yet unidentified light chain in Armenian hamster.

Table 1. Four Armenian Hamster IgG Subclasses Defined by Anti-Armenian hamster Ig mAbs**Anti-hamster IgG mAbs**

IgG subclass	G94-56	HIG65	G70-204	G192-1
IgG ₁	+	-	-	-
IgG ₂	-	+	+	+
IgG ₃	-	-	+	+
IgG ₄	-	-	-	+

Table 2. Properties of Selected Mouse Anti-Armenian Hamster Ig mAbs

Clone name	Isotype	Specificity	Species cross-reactivity*
G94-56	mIgG _{2b} , κ	IgG ₁	Syrian hamster IgG ₁
HIG-632	mIgG _{2b} , κ	IgG ₁	Syrian hamster IgG ₁
G94-90.5	mIgG ₁ , κ	IgG _{1,2}	Rat IgG1 & Syrian hamster IgG ₁
G192-1	mIgG ₁ , κ	IgG _{2,3,4}	Syrian hamster IgG ₂
HIG-65	mIgG ₁ , κ	IgG ₂	not observed
G70-204	mIgG ₁ , κ	IgG _{2,3}	not observed
HIG-88	mIgG ₁ , κ	IgG _{2,3}	not observed
G188-2	mIgG ₁ , κ	IgM	not observed
G188-9	mIgG ₁ , κ	IgM	Rat & Syrian hamster IgM
HIG-29	mIgG ₁ , κ	κ-light chain	Syrian hamster κ-light chain
G188-1	mIgG ₁ , κ	κ-light chain	Rat and Syrian hamster κ-chain
G192-2	mIgG ₁ , κ	λ ₁ light chain	Syrian hamster λ-lightchain
HIG-346	mIgG ₁ , κ	λ ₂ light chain	not observed

* Tested on guinea pig, human, mouse, rabbit, Syrian hamster.

Cross-reactivity with other species:

None of these anti-hamster Ig mAbs cross-reacted with mouse, rabbit, guinea pig or human Ig. However, it has been found that mAb G94-90.5 cross-reacted with rat IgG₁. G188-9 cross-reacted with rat IgM. G188-1 reacted with rat Igk-1^a allotype. Unlike RG7/7.6 and G188-1, mAb HIG-29 has no cross-reactivity with rat Ig κ-light chain.

Applications of the anti-hamster Ig mAbs:

Table 2 shows the properties of selected anti-hamster Ig mAbs. Most of them are available from BD Biosciences PharMingen (**Table 4**). These mAbs can be used as a secondary reagent in various immunoassays, such as flow cytometry, immunohistochemistry, western blot, immunoprecipitation, and in affinity chromatography to purify hamster IgG or IgM. The anti-hamster IgG or IgM mAbs can also be used to quantify hamster Ig in serum, tissue

culture supernatant and ascites by sandwich ELISA method (**Table 3**). Using the ELISA pairings, the IgG₁ level in normal Armenian hamster serum is approximately 0.35 mg/ml, IgG2a/b is about 4.46 mg/ml, consistent with the previous report that IgG1 is a minor IgG in Syrian hamster serum⁶.

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5. Springer, T. A., et al. (1982) Hybridoma. 1:257-273.
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Characterization of Armenian Hamster Ig *(continued from page 29)*

Table 3. ELISA Antibody Pairs for Quantification of Hamster Ig

Hamster Ig classes	Capture Ab (purified)	Detection Ab (biotinylated)	Standard (purified)
IgG1	HIG-632	G94-56	A19-3 or G235-2356
IgG2	HIG-65	G192-1	B81-3 or Ha4/8
IgG3	G70-204	HIG-88	A19-4
IgM	G188-2	G188-9	G235-1

Table 4. Product List

New cat. No.	Cat. No.	Specificity	Clone	Format	Size	Application*
554003	12071D	Anti-Armenian hamster IgG2, 3	G70-204	Purified	0.5 mg	ELISA
554004	12074D		G70-204	FITC	0.5 mg	FC
554005	12080D	Anti-hamster IgG1	G94-56	NA/LE	0.5 mg	FA
554006	12081D		G94-56	Purified	0.5 mg	ELISA
554007	12082D		G94-56	Biotin	0.5 mg	ELISA, FC
554008	12084D		G94-56	FITC	0.5 mg	FC
554009	12101D	Anti-hamster IgG	G70-204, G94-56	Purified	0.5 mg	ELISA
554010	12102D		G70-204, G94-56	Biotin	0.5 mg	ELISA, FC
554011	12104D		G70-204, G94-56	FITC	0.5 mg	FC
554012	12107E		G70-204, G94-56	HRP	1 ml	ELISA, WB
554024	12171D	Anti-hamster IgG2, 3, 4	G192-1	Purified	0.5 mg	ELISA
554025	12172D		G192-1	Biotin	0.5 mg	ELISA, FC
554026	12174D		G192-1	FITC	0.5 mg	FC
554029	12192D	Anti-Syrian hamster IgG2	G192-3	Biotin	0.5 mg	ELISA, FC
554031	12201D	Anti-hamster IgM	G188-2	Purified	0.5 mg	ELISA
554033	12204D		G188-2	FITC	0.5 mg	FC
554035	12212D	Anti-hamster IgM	G188-9	Biotin	0.5 mg	ELISA, FC
554036	12214D		G188-9	FITC	0.5 mg	FC
554056	12355B	Anti-hamster IgG	G70-204, G94-90.5	PE	0.2 mg	FC
550635	12371D	Anti-hamster Ig, κ -light chain	HIG-29	Purified	0.5 mg	ELISA
550636	12372D		HIG-29	Biotin	0.5 mg	ELISA, FC
550637	12381D	Anti-hamster IgG1	HIG-632	Purified	0.5 mg	ELISA
550638	12391D	Anti-Armenian hamster IgG2	HIG-65	Purified	0.5 mg	ELISA
550639	12401D	Anti-Armenian hamster IgG2, 3	HIG-88	Purified	0.5 mg	ELISA
550640	12402D		HIG-88	Biotin	0.5 mg	ELISA, FC
550336	74452E	Anti-rat and hamster Ig, κ	RG7/7.6	Biotin	1ml	IHC
550335	74442E	Anti-hamster IgG	HamIgG cocktail	Biotin	1ml	IHC
553950	11120D	Ar. hamster IgG1, λ isotype control (anti-TNP)	G235-2356	NA/LE	0.5 mg	FA
553951	11121D		G235-2356	Purified	0.5 mg	ELISA, FC
553952	11122C		G235-2356	Biotin	0.25 mg	FC
553953	11124C		G235-2356	FITC	0.25 mg	FC
553954	11125A		G235-2356	PE	0.1 mg	FC
553955	11128A		G235-2356	Cy-Chrome	0.1 mg	FC
553956	11129A		G235-2356	APC	0.1 mg	FC
553957	11130D	Ar. hamster IgM, λ isotype control (anti-TNP)	G235-1	NA/LE	0.5 mg	FA
553958	11131D		G235-1	Purified	0.5 mg	ELISA, FC
553959	11132C		G235-1	Biotin	0.25 mg	FC
553960	11134C		G235-1	FITC	0.25 mg	FC
553961	11140D	Ar. hamster Ig2, λ isotype control (anti-KLH)	Ha4/8	NA/LE	0.5 mg	FA
553962	11141D		Ha4/8	Purified	0.5 mg	ELISA, FC
553963	11142C		Ha4/8	Biotin	0.25 mg	FC
553964	11144C		Ha4/8	FITC	0.25 mg	FC
553965	11145A		Ha4/8	PE	0.1 mg	FC

Table 4. Product List (continued)

New cat. No.	Cat. No.	Specificity	Clone	Format	Size	Application*
553966	11148A		Ha4/8	Cy-Chrome	0.1 mg	FC
553967	11149A		Ha4/8	APC	0.1 mg	FC
550762	1114TA		Ha4/8	PerCP-Cy5.5	0.1 mg	FC
553968	11150D	Ar. hamster IgG1, κ isotype control (anti-TNP)	A19-3	NA/LE	0.5 mg	FA
553969	11151D		A19-3	Purified	0.5 mg	ELISA, FC
553970	11152C		A19-3	Biotin	0.25 mg	FC
553971	11154C		A19-3	FITC	0.25 mg	FC
553972	11155A		A19-3	PE	0.1 mg	FC
553973	11158A		A19-3	Cy-Chrome	0.1 mg	FC
553974	11159A		A19-3	APC	0.1 mg	FC
553975	1115PA		A19-3	PerCP	0.1 mg	FC
550763	1115TA		A19-3	PerCP-Cy5.5	0.1 mg	FC
553976	11160D	Ar. hamster IgG3, λ isotype control (anti-TNP)	A19-4	NA/LE	0.5 mg	FA
553977	11161D		A19-4	Purified	0.5 mg	ELISA, FC
553978	11162C		A19-4	Biotin	0.25 mg	FC
553979	11164C		A19-4	FITC	0.25 mg	FC
553980	11165A		A19-4	PE	0.1 mg	FC
559339	11220D	Ar. hamster IgG2, κ isotype control (anti-KLH)	B81-3	NA/LE	0.5 mg	FA
559277	11221D		B81-3	Purified	0.5 mg	ELISA, FC
550084	11222C		B81-3	Biotin	0.25 mg	FC
550056	11224C		B81-3	FITC	0.25 mg	FC
550085	11225A		B81-3	PE	0.1 mg	FC

*Suggested applications: **FA**: Functional Assay;
FC: flow cytometric analysis;
ELISA: Enzyme-linked immunosorbent assay;
IHC: immunohistochemistry;
WB: western blot

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Rapid Western Blot Screening Service for Signal Transduction Proteins

Jennifer Stevenson, Ph.D.

BD Biosciences – Transduction Laboratories

Sunday, April 1, 2001

Time: 8:00 a.m. – 9:00 a.m.

Room 300

Analysis of Apoptosis at the Cellular and Molecular Level

Lisa Stein, Ph.D.

BD Biosciences – PharMingen

Sunday, April 1, 2001

Time: 7:00 p.m. – 8:00 p.m.

Room 209A

Application of Tissue Arrays

Padma Kodukula, Ph.D.

BD Biosciences – PharMingen

Sunday, April 1, 2001

Time: 11:30 a.m. – 12:30 p.m.

Room 209A

Cytometric Bead Array (CBA) Technology: Recent Advances and Automation

Rudi Varro, Ph.D.

BD Biosciences – Immunocytometry Systems

Monday, April 2, 2001

Time: 8:00 a.m. – 9:00 a.m.

Room 209 A

DISCOVERY

Expanding Research Capabilities with the FACSDiVa Option for the FACS Vantage™ SE

Ben Verwer, Ph.D., M.B.A.

BD Biosciences – Immunocytometry Systems

Sunday, April 1, 2001

Time: 11:30 a.m. – 12:30 p.m.

Room 300

Use of Dimeric MHC: Ig Reagents in Defining CD8+ T cell Responses

Liisa Selin, M.D., Ph.D.

University of Massachusetts Medical Center

Tuesday, April 3, 2001

Time: 8:30 a.m. – 9:30 a.m.

Room 209A

Phenotypic and Functional Characterization of Antigen-specific T Cells: Comparison and Combination of Methods

Holden Maecker, Ph.D.

BD Biosciences – Immunocytometry Systems

Monday, April 2, 2001

Time: 1:00 p.m. – 2:00 p.m.

Room 300

Cincinnati Cytokine Capture Assay for Detection of In Vivo Cytokine Production

Fred Finkelman, Ph.D.

University of Cincinnati College of Medicine

Sunday, April 1, 2001

Time: 1:00 p.m. – 2:00 p.m.

Room 209A

Applications of ELISPOT Analysis

Paul V. Lehmann, Ph.D.

CTL Analyzers, LLC

Sunday, April 1, 2001

Time: 8:00 a.m. – 9:00 a.m.

Room 209A

DETECTION

Gene Expression Analysis Using Riboprobes*Susan Chambers*

BD Biosciences – PharMingen

Sunday, April 1, 2001

Time: 1:00 p.m. – 2:00 p.m.

Room 300

Close encounters of the TCR type: T cell activation leads to increased TCR avidity*Jonathan Schneck, M.D., Ph.D.*

John Hopkins University

Sunday, April 1, 2001

Time: 3:00 p.m. – 4:00 p.m.

Room 209A

Economic Factors for Successful Production of Secreted Products: the Impact of a Culture Medium and Method of Production*Kathie Fritchman*

BD Industrial

Tuesday, April 3, 2001

Time: 2:30 p.m. – 3:30 p.m.

Room 209A

The World of Macro and Micro Arrays*Gia Jokhadze, Ph.D.*

BD Biosciences – CLONTECH

Monday, April 2, 2001

Time: 1:00 p.m. – 2:00 p.m.

Room 209A

Cancer Expression Profiling Using SMART-amplified cDNA from Multiple Human Tumors*Bakhyt Zhumabayeva, Ph.D.*

BD Biosciences – CLONTECH

Tuesday, April 3, 2001

Time: 11:30 a.m. – 12:30 p.m.

Room 209A

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S**“Fluorescent Timer”: A Fluorescent Protein that Changes Over Time***Janet White*

BD Biosciences – CLONTECH

Tuesday, April 3, 2001

Time: 1:00 p.m. – 2:00 p.m.

Room 209A

Enzyme Linked Immunoassay Alternative to Radioactive Gel Shift Assay*Yu Fang, Ph.D.*

BD Biosciences – CLONTECH

Monday, April 2, 2001

Time: 4:00 p.m. – 5:00 p.m.

Room 300

Improvements for MATCHMAKER Two-Hybrid Systems: Combining a SMART cDNA Synthesis with Yeast Homologous Recombination for Library Construction and a High Throughput Microplate Growth Assay*Ann Holtz and Daizong Li*

BD Biosciences – CLONTECH

Monday, April 2, 2001

Time: 6:00 p.m. – 7:00 p.m.

Room 300

Transferring One Gene into Multiple Vectors in One Easy Step: Creator, a Novel DNA Cloning System*Andrew Farmer, Ph.D.*

BD Biosciences – CLONTECH

Sunday, April 1, 2001

Time: 3:00 p.m. – 4:00 p.m.

Room 300



NEW Products from PharMingen Since Catalog 2000

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Cell Biology Reagents					
66351E	559758	10X PBS Buffer		Buffer	50 ml
68981E	559925	7-AAD		Solution	2 ml
80056E	550622	Affinity purified rabbit anti-DcR1		Purified	200 µl
80586E	550857	Affinity purified rabbit anti-human SODD (Silencer of Death Domain)		Serum	200 µl
65879H	550475	Annexin V		APC	200 tests
65879X	550474	Annexin V		APC	100 tests
6587MH	559934	Annexin V		Cy5	200 tests
6587MX	559933	Annexin V		Cy5	100 tests
6587NH	559936	Annexin V		Cy5.5	200 tests
6587NX	559935	Annexin V		Cy5.5	100 tests
6900KK	559763	Annexin V-PE Apoptosis Detection Kit I		Kit	100 Tests
68851N	559683	Apaf-1	Rabbit PAb	Purified	50 µg
69336E	550363	APC11	Rabbit PAb	Serum	0.1 ml
69326E	550362	APC2	Rabbit PAb	Serum	0.1 ml
80621K	550943	Apoptotic Jurkat ELISA standard		Lyophilized	5 Vials
69441N	550435	APP	Rabbit PAb	Purified	50 µg
69451N	550436	APP	Rabbit PAb	Purified	50 µg
69911N	550559	Bcl-w	16H12 (Rat)	Purified	50 µg
69356E	550365	BID	Rabbit PAb	Serum	0.1 ml
68871N	559685	Bim	Rabbit PAb	Purified	50 µg
69101E	559893	Ca ²⁺ /Phospholipid-Dependent Protein Kinase (PKC)		Enzyme	1 vial
69111E	559894	Ca ²⁺ /Phospholipid-Dependent Protein Kinase, Catalytic Fragment (PKCM)		Enzyme	1 vial
69091E	559892	cAMP-Dependent Protein Kinase, Catalytic Subunit (PKA)		Enzyme	1 vial
60731A	556961	Cannabinoid CB1 Receptor	Rabbit PAb	Purified	0.1 mg
80641F	550873	Caspase-14	70A1426	Purified	150 µg
80806E	551150	Caspase-3, Active	Rabbit PAb (CMI)	Serum	100 µl
67341A	557035	Caspase-3, Active	Rabbit PAb	Purified	100 µg
68651G	559565	Caspase-3, Active	C92-605	Purified	25 µg
68652X	550557	Caspase-3, Active	C92-605	Biotin	100 tests
68655X	550821	Caspase-3, Active	C92-605	PE	100 tests
68654X	559341	Caspase-3, Active	C92-605	FITC	100 tests
69941K	550578	Caspase-3, Active - Human ELISA Ab Pair	19 & C92-605	Pair	10 plates
8072KK	550930	Caspase-3, Active - Human ELISA Set	19 & C92-607	Set	5 plates
6976KK	550480	Caspase-3, Active - FITC Mab Apoptosis Kit	C92-605	Kit	100 tests
8067KK	550914	Caspase-3, Active - PE Mab Apoptosis Kit	C92-605	Kit	100 tests
6899KK	559762	Caspase-3, Active - PE PAb Apoptosis Kit	Rabbit PAb	Kit	100 Tests
66361E	559759	Cell Lysis Buffer		Buffer	50 ml
60701N	556967	GABA A Receptor α 1	Rabbit PAb	Purified	50 µg
69491N	550440	GFR α -1	Rabbit PAb	Purified	50 µg
69501N	550442	GFR α -2	Rabbit PAb	Purified	50 µg
69511N	550443	GFR α -3	Rabbit PAb	Purified	50 µg
69221A	559931	Glutamate Decarboxylase GAD65	GAD-6	Purified	0.1 mg
6855KK	558904	Granzyme A Antibody Reagent Set		PE	100 tests
6856KK	558905	Granzyme A Antibody Reagent Set		FITC	100 tests
69901N	550558	Granzyme B	2C5/F5	Purified	50 µg
80601N	550859	Human A20	E5-1619	Purified	50 µg
68431A	558892	Human Ankyrin B	2.2	Purified	0.1 mg
69211A	559930	Human Blnk	2B11	Purified	0.1 mg
68806E	559678	Human BRCA-2	Rabbit PAb	Serum	0.1 ml
69261A	559956	Human BRCA-2	D13-2068	Purified	0.1 mg
69236E	559932	Human Caspase 8	Rabbit PAb	Serum	0.1 ml
80481N	550742	Human Caspase-10	Rabbit PAb	Purified	50 µg
69461N	550437	Human Caspase-9	Rabbit PAb	Purified	50 µg
69471N	550438	Human Caspase-9	Rabbit PAb	Purified	50 µg
68816E	559679	Human Cdc34	Rabbit PAb	Serum	0.1 ml
68466E	558895	Human Cdc37	Rabbit PAb	Serum	0.1 ml

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
68741A	559669	Human Chk	13G2	Purified	0.1 mg
67661A	558783	Human CNTFR	AN-H6	Purified	0.1 mg
68421A	558891	Human CNTFR	AN-E4	Purified	0.1 mg
69831N	550508	Human Cytokeratin 18	RCK106	Purified	50 µg
69811N	550506	Human Cytokeratin 5	RCK103	Purified	50 µg
69801N	550505	Human Cytokeratin 5 & 8	RCK102	Purified	50 µg
69821N	550507	Human Cytokeratin 7	RCK105	Purified	50 µg
68861N	559684	Human DcR2	Rabbit PAb	Purified	50 µg
80001N	550601	Human DFF40/CAD (a.a. 147-164)	Rabbit PAb	Purified	50 µg
80021N	550603	Human DFF40/CAD (a.a. 203-218)	Rabbit PAb	Purified	50 µg
80011N	550602	Human DFF40/CAD (a.a. 3-18)	Rabbit PAb	Purified	50 µg
69481N	550439	Human DR6	Rabbit PAb	Purified	50 µg
68486E	558897	Human Fizzy	Rabbit PAb	Serum	0.1 ml
68826E	559680	Human Gfi-1	Rabbit PAb	Serum	0.1 ml
68391A	557449	Human Granzyme A	CB9	Purified	0.1 mg
68921A	559691	Human Heat Shock Protein 72/73	W27	Purified	0.1 mg
69521N	550444	Human IKK α	Rabbit PAb	Purified	50 µg
69531N	550445	Human IKK β	Rabbit PAb	Purified	50 µg
68771A	559675	Human IKK γ	C73-764	Purified	0.1 mg
80491N	550743	Human IKKB/IKK2	10AG2	Purified	50 µg
68931N	559695	Human IRAK	Rabbit PAb	Purified	50 µg
69311A	550430	Human IRF3	SL-14.2	Purified	0.1 mg
69301A	550428	Human IRF3	SL-12.1	Purified	0.1 mg
68896E	559688	Human I-TRAF	Rabbit PAb	Serum	0.1 ml
68781A	559676	Human JNKK2	C87-565	Purified	0.1 mg
69141A	559903	Human Ku-70 (β subunit)	N3H10	Purified	0.1 mg
68611A	559027	Human Mcl-1	22	Purified	0.1 mg
69151A	559904	Human Myelin Basic Protein	Myelin BP	Purified	0.1 mg
68916E	559690	Human Nip3	Rabbit PAb	Serum	0.1 ml
68751A	559670	Human ORC-2	920-4-41	Purified	0.1 mg
69271A	550025	Human p63	Y4A3	Purified	0.1 mg
69251A	559952	Human p63	5G8	Purified	0.1 mg
69241A	559951	Human p63	4A4	Purified	0.1 mg
69921N	550560	Human p73	Rabbit PAb	Purified	50 µg
68906E	559689	Human RIP	Rabbit PAb	Serum	0.1 ml
69291A	550429	Human Sur2	D27-1805	Purified	0.1 mg
80501N	550744	Human TANK Binding Kinase 1(TBK)	108A429	Purified	50 µg
69431A	550515	Human Trail	RIK-2	Purified	0.1 mg
69435A	550516	Human Trail	RIK-2	PE	0.1 mg
69430C	550912	Human Trail	RIK-2	NALE	0.25 mg
69891A	550517	Human Trail	RIK-1	Purified	0.1 mg
69121A	559901	Human Transcription Factor IIB, Human	IIB8	Purified	0.1 mg
6977KK	550501	Human Underphosphorylated Rb - FITC Isotype Control Reagent Set	G99-549	Set	100 tests
6978KK	550502	Human Underphosphorylated Rb - PE Isotype Control Reagent Set	G99-549	Set	100 tests
68881N	559687	Human ZIP Kinase	Rabbit PAb	Purified	50 µg
69791F	550504	Itk	2F12.1	Purified	150 µg
69791N	550503	Itk	2F12.1	Purified	50 µg
80611N	550860	Mouse Boo	D12-1932	Purified	50 µg
16406Y	550468	Mouse Brain Lysate		Lysate	0.1 mg
80061N	550626	Mouse desmin	RD-301	Purified	50 µg
68841N	559682	Mouse ICAD	Rabbit PAb	Purified	50 µg
69976E	550598	Nedd4	Rabbit PAb	Serum	0.1 ml
69541N	550446	Neurturin	Rabbit PAb	Purified	50 µg
69021G	559885	NMDAR1 (C1)	Rabbit PAb	Purified	0.025 mg
69031G	559886	NMDAR1 (C2)	Rabbit PAb	Purified	0.025 mg
69041G	559887	NMDAR1 (C2')	Rabbit PAb	Purified	0.025 mg
69051G	559888	NMDAR1 (N1)	Rabbit PAb	Purified	0.025 mg
69061T	559889	NMDAR2A	Rabbit PAb	Purified	0.01 mg
69071T	559890	NMDAR2B	Rabbit PAb	Purified	0.01 mg

NEW Products *(continued from page 35)*

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Cell Biology Reagents (continued)					
69081T	559891	NMDAR2C	Rabbit PAb	Purified	0.01 mg
69346E	550364	NUP93	Rabbit PAb	Serum	0.1 ml
80471N	550740	Osteoprotegerin	98A1071	Purified	50 µg
68446E	558893	p19 Skp1	Rabbit PAb	Serum	0.1 ml
68536E	558902	p27	Rabbit PAb	Serum	0.1 ml
69621A	550455	p33ING	CAb1	Purified	0.1 mg
68666E	559541	Pan-MiniChromosome Maintenance (universal)	Rabbit PAb	Serum	0.1 ml
1454KK	550783	PE labeled anti-human Cyclin B1/ Isotype control reagent set	GNS-1	PE	100 test
80531N	550747	Phospho-specific Akt1, Human	104A282	Purified	50 µg
80571E	550825	PI/Rnase Staining Buffer		Buffer	100 ml
68731A	559600	PTEN	A2B1	Purified	0.1 mg
69841N	550509	Purified anti-Cytokeratin 14	RCK107	Purified	50 µg
69131A	559902	Purified anti-human Ku-80 (α subunit)	N9C1	Purified	0.1 mg
80461N	550737	Purified anti-human Tankyrase	19A449	Purified	50 µg
80456E	550736	Purified anti-mouse ICAD		Purified	200 µl
80641N	550872	Purified mouse anti-caspase-14	70A1426	Purified	50 µg
80521N	550746	Purified mouse anti-D4 GDI	97A1015	Purified	50 µg
80591N	550858	Purified mouse anti-human nucleosome	13G10	Purified	50 µg
80631N	550870	Purified mouse anti-human nucleosome	6E5	Purified	50 µg
80541N	550780	Purified mouse anti-human nucleosome	11E6	Purified	50 µg
80551N	550781	Purified Mouse Anti-poly ADP-ribose (PAR) monoclonal antibody	10H	Purified	50 µg
80566E	550782	Rabbit anti-human Cyclin G1		Serum	200 µl
16386Y	559929	Rat brain lysate		Lysate	100 µg
69161A	559905	Retinoblastoma protein (a.a. 121-140)	4H6	Purified	0.1 mg
69181A	559907	Retinoblastoma protein (a.a. 511-530)	1E5	Purified	0.1 mg
69191A	559908	Retinoblastoma protein (a.a. 571-590)	1D1	Purified	0.1 mg
69201A	559909	Retinoblastoma protein (a.a. 886-905)	3C8	Purified	0.1 mg
69171A	559906	Retinoblastoma protein (a.a. 280-300)	7F12	Purified	0.1 mg
69746E	550469	Serotonin Receptor 5-HT1A	Guinea Pig PAb	Serum	0.1 ml
69756E	550470	Serotonin Receptor 5-HT1B	Guinea Pig PAb	Serum	0.1 ml
68761A	559674	Sonic hedgehog	C66-321	Purified	0.1 mg
15191N	550585	Sos1	Rabbit PAb	Purified	50 µg
68121N	556589	Stat2	Rabbit PAb	Purified	50 µg
68141G	559830	Stat3 (P-Tyr)	Rabbit PAb	Purified	25 µg
69611T	550454	Synapsin I	Rabbit PAb	Purified	10 µg
67371A	557039	Tie2	33	Purified	0.1 mg
69881N	550513	Vimentin	RV202	Purified	50 µg
69381U	550378	Z-DEVD-FMK, Caspase-3 Inhibitor		Purified	1 mg
69421U	550411	Z-FA-FMK, Negative Control for Caspase Inhibitors		Purified	1 mg
69401U	550380	Z-IETD-FMK, Caspase-8 Inhibitor		Purified	1 mg
69411U	550381	Z-LEHD-FMK, Caspase-9 Inhibitor		Purified	1 mg
69361U	550377	Z-VAD-FMK, General Caspase Inhibitor		Purified	1 mg
69391U	550379	Z-VEID-FMK, Caspase-6 Inhibitor		Purified	1 mg
DimerX Reagents					
24641N	551263	DimerX I: Soluble Dimeric Mouse HLA-A2:Ig Fusion Protein		Purified	50 µg
24591C	550750	DimerX I: Soluble Dimeric Mouse H-2Kb:Ig Fusion Protein		Purified	0.25 mg
24601C	550751	DimerX I: Soluble Dimeric Mouse H-2Ld:Ig Fusion Protein		Purified	0.25 mg

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Cytokine and Chemokine Reagents					
Human					
23491X	559159	Human C5a receptor (CD88)	C85-4124	Purified	100 tests
25141A	551121	Human CCR4	1G1.1	Purified	0.1 mg
24431C	550937	Human CCR7	2H4.1	Purified	0.25 mg
23121D	550478	Human GRO (α , β , γ)	10G4.1	Purified	0.5 mg
23432D	558933	Human IFN- γ receptor α chain	GIR-208	Biotin	0.5 mg
23489A	550477	Human IFN- γ receptor α chain	GIR-94	APC	0.1 mg
23482D	558936	Human IFN- γ receptor α chain	GIR-94	Biotin	0.5 mg
23485B	558937	Human IFN- γ receptor α chain	GIR-94	PE	0.2 mg
23855A	550078	Human MIP-1 β	D21-1351	PE	0.1 mg
23851A	550079	Human MIP-1 β	D21-1351	Purified	0.1 mg
23845A	550076	Human TARC	2D8.1	PE	0.1 mg
23841A	550077	Human TARC	2D8.1	Purified	0.1 mg
24551W	555104	Human TGF β		Purified	2 μ g
23881A	550483	Human Thioredoxin	polyclonal	Purified	0.1 mg
23711A	559969	Human Thioredoxin (full length, TRX 1-104)	2G11/TRX	Purified	0.1 mg
23714A	559968	Human Thioredoxin (full length, TRX 1-104)	2G11/TRX	FITC	0.1 mg
23691A	559965	Human Thioredoxin (truncated, TRX 1-84)	4H9(TRX2)	Purified	0.1 mg
23891D	550514	Human TNF receptor Type I	MABTNFR1-B1	Purified	0.5 mg
Mouse					
23662D	559919	Mouse β IL-3R/ β c	JORO50	Biotin	0.5 mg
23665B	559920	Mouse β IL-3R/ β c	JORO50	PE	0.2 mg
23672D	559922	Mouse CCR5	C34-3448	Biotin	0.5 mg
23675B	559923	Mouse CCR5	C34-3448	PE	0.2 mg
23671D	559921	Mouse CCR5	C34-3448	Purified	0.5 mg
23522D	559558	Mouse CRG-2		Biotin	0.5 mg
23621D	559911	Mouse IFN- γ receptor α chain (CD119)	2E2	Purified	0.5 mg
23622D	550482	Mouse IFN- γ Receptor α (CD119)	2E2	Biotin	0.5 mg
23681D	559917	Mouse IFN- γ receptor β chain	MOB-47	Purified	0.5 mg
23932D	550606	Mouse IL-1 α	C1150-27	Biotin	0.5 mg
23405A	559810	Mouse IL-1 α	ALF-161	PE	0.1 mg
23401A	559811	Mouse IL-1 α	ALF-161	Purified	0.1 mg
23401D	550604	Mouse IL-1 α	ALF-161	Purified	0.5 mg
23400C	557537	Mouse IL-1 α	ALF-161	NA/LE	0.25 mg
23411D	550605	Mouse IL-1 β	B122	Purified	0.5 mg
23632D	559913	Mouse IL-10 receptor	1B1.3a	Biotin	0.5 mg
23635B	559914	Mouse IL-10 receptor	1B1.3a	PE	0.2 mg
23631D	559912	Mouse IL-10 receptor	1B1.3a	Purified	0.5 mg
23630D	550012	Mouse IL-10 receptor	1B1.3a	NA/LE	0.5 mg
23641D	559915	Mouse TNF receptor Type I (p55)	55R-286	Purified	0.5 mg
23652D	550476	Mouse TNF receptor Type II (p75)	TR75-89	Biotin	0.5 mg
23655B	550086	Mouse TNF receptor Type II (p75)	TR75-89	PE	0.2 mg
23651D	559916	Mouse TNF receptor Type II (p75)	TR75-89	Purified	0.5 mg
23351A	559500	Mouse/Rat TNF- α	TN3-19.12	Purified	0.1 mg
Recombinant Proteins					
19741T	550068	Recombinant Human GM-CSF		Purified	10 μ g
24541T	551130	Recombinant Human IL-10 (ELISA Standard)		Purified	10 μ g
24581T	550934	Recombinant Human Thioredoxin		Purified	10 μ g
19661T	550071	Recombinant Human IL-6		Purified	10 μ g
19481V	559612	Recombinant Mouse IL-1 α		Purified	5 μ g
19281T	550070	Recombinant Mouse IL-10		Purified	10 μ g
19211P	550069	Recombinant Mouse IL-2		Purified	20 μ g
19231T	550067	Recombinant Mouse IL-4		Purified	10 μ g
25061V	550072	Recombinant Rat IFN- γ		Purified	5 μ g

NEW Products *(continued from page 37)*

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Cytokine and Chemokine Reagents <i>(continued)</i>					
Other					
2354KK	559619	BrdU Flow Kit		Kit	50 Test
23901Z	550583	Leukocyte Activation Cocktail, with GolgiPlug		Frozen Liquid	100 µl x 2
Cytometric Bead Array (CBA) Kits					
550749	550749	Human Th1/Th2 Cytokine Cytometric Bead Array (CBA) Kit		Kit	50 tests
04200K	550026	Mouse Immunoglobulin Isotyping Cytometric Bead Array (CBA) Kit		Kit	100 tests
0421CD	550065	BD CBA Software		CD	1 CD
BD OptEIA™ ELISA Sets and Kits					
Human					
2711KK	550499	Human C3a OptEIA Kit		Kit	1 plate
2712KK	550500	Human C5a OptEIA Kit		Kit	1 plate
2675KK	559111	Human IL-1 β OptEIA Kit		Kit	2 plates
2724KK	550610	Human TNF-α OptEIA Kit II		Kit	2 plate
2722KK	550612	Human IFN-γ OptEIA Kit II		Kit	2 plate
2660KI	559268	Human IL-15 OptEIA Set		Set	Rgts for 20 plts
2732KI	550926	Human IL-10 OptEIA Set		Set	Rgts for 20 plts
2702KK	559488	Human IL-2/IFN- γ OptEIA Combination Kit		Kit	2 plates
2700KK	559486	Human IL-2/TNF- α OptEIA Combination Kit		Kit	2 plates
2701KK	559487	Human IL-4/IFN- γ OptEIA Combination Kit		Kit	2 plates
2703KK	559489	Human IL-4/IL-10 OptEIA Combination Kit		Kit	2 plates
Mouse					
2719KK	550582	Mouse IFN- γ OptEIA Kit		Kit	1 plate
2667KK	559732	Mouse TNF- α (Mono/Poly) OptEIA Kit		Kit	2 plates
2730KK	550800	Mouse IL-10 OptEIA Kit		Kit	2 plate
2666KI	559603	Mouse IL-1 β OptEIA Set		Set	Rgts for 20plts
2656KI	550063	Mouse IL-17 OptEIA Set		Set	Rgts for 20plts
2670KI	559767	Mouse TCA4 OptEIA Set		Set	Rgts for 20plts
2706KI	550347	Mouse IL-1 α OptEIA Set		Set	Rgts for 20plts
2713KI	550534	Reagent Set B (pH9.5 buffer)		Reagent Set	20 plates
2715KI	550536	Reagent Set A (pH 6.5 buffer)		Reagent Set	20 plates
Other					
2663KI	559345	Pig IFN-γ OptEIA Set		Set	Rgts for 20plts
24411D	550823	Pig IL-1 β	4B2.1	Purified	0.5 mg
2704KI	550060	Rat GM-CSF OptEIA Set		Set	Rgts for 20plts
2726KK	550734	Rat TNF α OptEIA Kit		Kit	2 plates
2671KI	559813	Rabbit IL-8 Set	rIL-8 Set	Set	Rgts for 20plts
Antibodies to Human Cell Surface Molecules					
38101A	550814	Human 2B4	2-69	Purified	0.1 mg
37941A	550491	Human Aminopeptidase A	2D3/APA	Purified	0.1 mg
37945X	550492	Human Aminopeptidase A	2D3/APA	PE	100 tests
38061A	550806	Human blood group A	NaM87-1F6	Purified	0.1 mg
37871A	550258	Human CD103	Ber-ACT8	Purified	0.1 mg
37874X	550259	Human CD103	Ber-ACT8	FITC	100 tests
37875X	550260	Human CD103	Ber-ACT8	PE	100 tests
37981A	550724	Human CD108	MEM-150	Purified	0.1 mg
37341B	559035	Human CD11a	G25.2	Purified	0.2 mg
30449X	559875	Human CD11a/LFA-1	HI111	APC	100 tests
30459X	550019	Human CD11b/Mac-1	ICRF44	APC	100 tests
30489X	559877	Human CD11c	B-ly6	APC	100 tests

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
37741A	559780	Human CD141	1A4	Purified	0.1 mg
37745X	559781	Human CD141	1A4	PE	100 tests
37841A	550252	Human CD142	HTF-1	Purified	0.1 mg
37845X	550312	Human CD142	HTF-1	PE	100 tests
37901A	550314	Human CD146	P1H12	Purified	0.1 mg
37905X	550315	Human CD146	P1H12	PE	100 tests
37441B	559045	Human CD15	MMA	Purified	0.2 mg
37831A	550052	Human CD153 (CD30L)	D2-1173	Purified	0.1 mg
37832X	550053	Human CD153 (CD30L)	D2-1173	Biotin	100 tests
37750D	559782	Human CD158b	CH-L	NA/LE	0.5 mg
37751A	559783	Human CD158b	CH-L	Purified	0.1 mg
37754X	559784	Human CD158b	CH-L	FITC	100 tests
37755X	559785	Human CD158b	CH-L	PE	100 tests
37271A	558815	Human CD164	103B2	Purified	0.1 mg
37660D	559451	Human CD165	13H12	NA/LE	0.5 mg
38111A	550867	Human CD16b	CLB-gran11.5	Purified	0.1 mg
34229X	559775	Human CD1a	HI149	APC	100 tests
37851A	550254	Human CD1d	CD1d42	Purified	0.1 mg
37855X	550255	Human CD1d	CD1d42	PE	100 tests
37331B	559034	Human CD2	S5.2	Purified	0.2 mg
33269X	559776	Human CD20	2H7	APC	100 tests
30699X	559867	Human CD21	B-ly4	APC	100 tests
33749X	559770	Human CD28	CD28.2	APC	100 tests
30868X	559882	Human CD29	4-Mar	Cy-Chrome	100 tests
30869X	559883	Human CD29	4-Mar	APC	100 tests
36745X	556049	Human CD29	HUTS-21	PE	100 tests
34435X	550041	Human CD30	BerH8	PE	100 tests
37411B	559042	Human CD31	L133.1	Purified	0.2 mg
30935X	550586	Human CD32	FLI8.26 (2003)	PE	100 tests
30939X	559769	Human CD32	FLI8.26 (2003)	APC	100 tests
38031A	550760	Human CD34	563	Purified	0.1 mg
38035X	550761	Human CD34	563	PE	100 tests
30965X	559872	Human CD35	E11	PE	100 tests
31088X	559768	Human CD41a	HIP8	Cy-Chrome	100 tests
31089X	559777	Human CD41a	HIP8	APC	100 tests
31140D	559863	Human CD43	1G10	NA/LE	0.5 mg
31219X	559942	Human CD44	G44-26	APC	100 tests
37451B	559046	Human CD44	L178	Purified	0.2 mg
31269X	550855	Human CD45RA	HI100	APC	100 tests
31309X	559865	Human CD45RO	UCHL1	APC	100 tests
37711A	559594	Human CD49a	SR84	Purified	0.1 mg
37715X	559596	Human CD49a	SR84	PE	100 tests
31478X	559880	Human CD49d	9F10	Cy-Chrome	100 tests
31479X	559881	Human CD49d	9F10	APC	100 tests
37381B	559039	Human CD5	L17F12	Purified	0.2 mg
31565X	550037	Human CD51/61	23C6	PE	100 tests
31622X	559817	Human CD54	HA58	Biotin	100 tests
31629X	559771	Human CD54	HA58	APC	100 tests
37461B	559047	Human CD54	LB-2	Purified	0.2 mg
37421B	559043	Human CD56	NCAM16.2	Purified	0.2 mg
37491B	559049	Human CD56	MY31	Purified	0.2 mg
37561B	559057	Human CD61	RUU-PL7F12	Purified	0.2 mg
33368X	550040	Human CD62E (E-Selectin)	68-5H11	Cy-Chrome	100 tests
37481B	559050	Human CD62L (LECAM-1)	SK11	Purified	0.2 mg
32239X	559772	Human CD62L (L-Selectin)	DREG-56	APC	100 tests
37861A	550256	Human CD73	AD2	Purified	0.1 mg
37695X	559589	Human CD84	2G7	PE	100 tests
37951A	550493	Human CD88 (C5a receptor)	D53-1473	Purified	0.1 mg
37955X	550494	Human CD88 (C5a receptor)	D53-1473	PE	100 tests
33089A	559869	Human CD90 (Thy-1)	5E10	APC	0.1 mg
37961A	550495	Human CD91	A2MRα2	Purified	0.1 mg

NEW Products *(continued from page 39)*

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Antibodies to Human Cell Surface Molecules <i>(continued)</i>					
37964X	550496	Human CD91	A2MR α 2	FITC	100 tests
37965X	550497	Human CD91	A2MR α 2	PE	100 tests
38051A	550817	Human CD91	A2MR- β 1	Purified	0.1 mg
38055X	550818	Human CD91	A2MR- β 1	PE	100 tests
35159X	559876	Human CD94 (KP43)	HP-3D9	APC	100 tests
37671A	550042	Human CD95 (Azide free)	EOS9.1	Purified	0.1 mg
33458X	559773	Human CD95 (Fas/APO-1)	DX2	Cy-Chrome	100 tests
37651A	559448	Human CD98 light chain	TÜ143	Purified	0.1 mg
37654X	559449	Human CD98 light chain	TÜ143	FITC	100 tests
37655X	559450	Human CD98 light chain	TÜ143	PE	100 tests
37700D	559590	Human CDw150	A12	NA/LE	0.5 mg
33658A	559879	Human C-kit(CD117)	YB5.B8	Cy-Chrome	100 tests
33659A	550412	Human C-kit(CD117)	YB5.B8	APC	0.1 mg
35822X	559950	Human cutaneous lymphocyte antigen (CLA)	HECA-452	Biotin	100 tests
38091A	550812	Human Cw60	UM4D4	Lyophilized	0.1 mg
37130D	557184	Human CXCR3	1C6/CXCR3	NA/LE	0.5 mg
37760D	559786	Human DNAM-1	DX11	NA/LE	0.5 mg
37761A	559787	Human DNAM-1	DX11	Purified	0.1 mg
37764X	559788	Human DNAM-1	DX11	FITC	100 tests
37765X	559789	Human DNAM-1	DX11	PE	100 tests
38071A	550808	Human Fy6 (Duffy)	NaM185-2C3	Purified	0.1 mg
33684A	559878	Human $\gamma\delta$ TCR	B1	FITC	100 tests
32594A	559943	Human Glycophorin A	GA-R2	FITC	0.1 mg
32598A	559944	Human Glycophorin A	GA-R2	Cy-Chrome	0.1 mg
37721A	559778	Human gp190	7G7	Purified	0.1 mg
37725X	559779	Human gp190	7G7	PE	100 tests
37881A	559790	Human gp190	12D3	Purified	0.1 mg
37885X	559791	Human gp190	12D3	PE	100 tests
37771A	559895	Human HLA-DO	DOB.L1	Purified	0.1 mg
37814K	550020	Human HLA-DO Set		FITC	Set
37815K	550021	Human HLA-DO PE Set		PE	Set
32419X	559868	Human HLA-DR	Tü36	APC	100 tests
34239X	559866	Human HLA-DR	G46-6	APC	100 tests
37975X	550723	Human IL-12R β 2	2B6/12 β 2	PE	100 tests
37791A	559954	Human Insulin Receptor	3B6/IR	Purified	0.1 mg
37795X	559955	Human Insulin Receptor	3B6/IR	PE	100 tests
36840D	559239	Human KIR-NKAT2	DX27	NA/LE	0.5 mg
38081A	550810	Human LAIR-1	DX26	Purified	0.1 mg
37781A	559898	Human LMP-1	S12	Purified	0.1 mg
37805K	550018	Human LMP-1 PE Set		PE	Set
35674X	559774	Human MUC1	HMPV.2	FITC	100 tests
37591A	559254	Human NPM-ALK/ALK	ALK	Purified	0.1 mg
37604K	559818	Human NPM-ALK/ALK Set		FITC	Set
37605K	559257	Human NPM-ALK/ALK PE Set		PE	Set
37921A	550488	Human pre-B cell	VpreB8	Purified	0.1 mg
37931A	550489	Human pre-B cell	VpreB9	Purified	0.1 mg
37935X	550490	Human pre-B cell	VpreB9	PE	100 tests
38001A	550728	Human Terminal Transferase (TdT)	E17-1519	Purified	0.1 mg
38014K	550754	Neutrophil Set		FITC	kit
37911E	550473	p-glycoprotein (MDR) Positive Control Cells	PMG-Y	Purified	1 ml
38024K	550756	Terminal Transferase (TdT) Set		FITC	kit
38025K	550757	Terminal Transferase (TdT) Set		PE	kit
Antibodies that Cross-React with Non-Human Primate Cell Surface Molecules					
71775L	550851	Human CD11a/LFA-1	HI111	PE	50 test
71779L	550852	Human CD11a/LFA-1	HI111	APC	50 test
71455L	557299	Human CD154 (CD40 Ligand/gp39)	TRAP1	PE	50 tests
71315L	557138	Human CD25	M-A251	PE	50 tests

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
71644L	557508	Human CD31	WM59	FITC	50 test
71725L	550619	Human CD34	563	PE	50 test
7173PL	550631	Human CD4	L200	PerCP	50 test
71731A	550625	Human CD4	L200	Purified	0.1 mg
71734L	550628	Human CD4	L200	FITC	50 test
71735L	550630	Human CD4	L200	PE	50 test
71431A	557293	Human CD41b	HIP2	Purified	0.1 mg
71671A	559458	Human CD42a	ALMA.16	Purified	0.1 mg
71674L	550472	Human CD42a	ALMA.16	FITC	50 test
7119PL	557513	Human CD45	Tü116	PerCP	50 test
71651A	557509	Human CD49f	GoH3	Purified	0.1 mg
71654L	557510	Human CD49f	GoH3	FITC	50 test
71655L	557511	Human CD49f	GoH3	PE	50 test
71681A	559490	Human CD6	M-T605	Purified	0.1 mg
71684L	559491	Human CD6	M-T605	FITC	50 test
71685L	559492	Human CD6	M-T605	PE	50 test
71424L	557291	Human CD61	VI-PL2	FITC	50 tests
71425L	557290	Human CD61	VI-PL2	PE	50 tests
71714L	550866	Human CD62P (P Selectin)	AC1.2	HRP	50 test
71715L	550561	Human CD62P (P Selectin)	AC1.2	PE	50 test
71484L	550759	Human CD63	H5C6	FITC	50 test
71481A	557304	Human CD63	H5C6	Purified	0.1 mg
71485L	557305	Human CD63	H5C6	PE	50 tests
71765L	550634	Human CD83	HB15e	PE	50 test
71475L	557303	Human CDw137 (4-1BB)	4B4-1	PE	50 tests
71755L	550633	Human CXCR3	1C6/CXCR3	PE	50 test
71614L	557348	Human HLA-ABC	G46-2.6	FITC	50 test
71784L	550853	Human HLA-DR, P, Q	Tü39	FITC	50 test
71271A	558888	Human IFN- γ	4S.B3	Purified	0.1 mg
71231A	558881	Human IL-2	MQ1-17H12	Purified	0.1 mg
71234L	559361	Human IL-2	MQ1-17H12	FITC	50 test
7114PL	559425	Mouse IgG1, κ isotype control	MOPC-21	PerCP	50 test
7117PL	559426	Mouse IgG3, κ isotype control	J606	PerCP	50 test
71411A	550054	Rat IgG2a, κ , isotype control	R35-95	Purified	0.1 mg
71414L	557228	Rat IgG2a, κ , isotype control	R35-95	FITC	50 tests
71415L	557229	Rat IgG2a, κ , isotype control	R35-95	PE	50 tests

Ig/2nd Step Reagents

Isotype Controls

1114TA	550762	Hamster IgG isotype control (anti-KLH)	Ha4/8	PerCP-Cy5.5	0.1 mg
1115TA	550763	Hamster IgG isotype control (anti-TNP)	A19-3	PerCP-Cy5.5	0.1 mg
11129A	553956	Hamster IgG isotype control (anti-TNP)	G235-2356	APC	0.1 mg
11225A	550085	Hamster IgG, group 2, κ isotype control (anti-KLH)	B81-3	PE	0.1 mg
11222C	550084	Hamster IgG, group 2, κ isotype control (anti-KLH)	B81-3	Biotin	0.25 mg
03341D	550924	Mouse IgA, κ isotype control (b allotype)	MOPC-320	Purified	0.5 mg
03252C	550615	Mouse IgG1, κ isotype control	MOPC-31C	Biotin	0.25 mg
03254C	550616	Mouse IgG1, κ isotype control	MOPC-31C	FITC	0.25 mg
03255A	550617	Mouse IgG1, κ isotype control	MOPC-31C	PE	0.1 mg
03258A	550618	Mouse IgG1, κ isotype control	MOPC-31C	Cy-Chrome	0.1 mg
0325PA	550672	Mouse IgG1, κ isotype control	MOPC-31C	PerCP	0.1 mg
03029A	550882	Mouse IgG2a, κ isotype control	G155-178	APC	0.1 mg
0302TA	551115	Mouse IgG2a, κ isotype control	G155-178	PerCP-Cy5.5	0.1 mg
03089A	550883	Mouse IgM, κ isotype control (anti-TNP)	G155-228	APC	0.1 mg
03351D	550963	Mouse IgM, λ isotype control	PMG1-146.1	Purified	0.5 mg
1120TA	551072	Rat IgG1, λ isotype control	A110-1	PerCP-Cy5.5	0.1 mg
11209A	550884	Rat IgG1, λ isotype control (anti-KLH)	A110-1	APC	0.1 mg
1102TA	550765	Rat IgG2a, κ isotype control	R35-95	PerCP-Cy5.5	0.1 mg
1118TA	550764	Rat IgG2b, κ isotype control	A95-1	PerCP-Cy5.5	0.1 mg
07761A	550875	Rabbit IgG Isotype Standard		Purified	0.1 mg

NEW Products *(continued from page 41)*

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Ig/2nd Step Reagents <i>(continued)</i>					
Anti-Immunoglobulin Reagents					
12371D	550635	Hamster Ig, κ light chain	HIG-29	Purified	0.5 mg
12372D	550636	Hamster Ig, κ light chain	HIG-29	Biotin	0.5 mg
12381D	550637	Hamster IgG	HIG-632	Purified	0.5 mg
12391D	550638	Hamster IgG	HIG-65	Purified	0.5 mg
12401D	550639	Hamster IgG	HIG-88	Purified	0.5 mg
12402D	550640	Hamster IgG	HIG-88	Biotin	0.5 mg
12069A	550826	Mouse Ig (multiple adsorption)	Polyclonal	APC	0.1 mg
12065B	550589	Mouse Ig (multiple adsorption)	Polyclonal	PE	0.2 mg
05181D	551086	Mouse IgA b (Igh-2b)	HIS-M2	Purified	0.5 mg
02235A	550083	Mouse IgG1	A85-1	PE	0.1 mg
02281D	550674	Mouse IgG1	X56	Purified	0.5 mg
02289A	550874	Mouse IgG1	X56	APC	0.1 mg
02207E	550588	Mouse IgM	II/41	HRP	1 ml
02209A	550676	Mouse IgM	II/41	APC	0.1 mg
0208TA	550881	Mouse IgM	R6-60.2	PerCP-Cy5.5	0.1 mg
07741D	550326	Rabbit IgG	C101-359	Purified	0.5 mg
07751D	550423	Rabbit IgG	C101-167	Purified	0.5 mg
07752D	550346	Rabbit IgG	C101-167	Biotin	0.5 mg
07771D	550939	Rabbit IgM	367.2	Purified	0.5 mg
07772B	550938	Rabbit IgM	367.2	Biotin	0.2 mg
07781D	551290	Rabbit IgA	102	Purified	0.5 mg
07782B	551291	Rabbit IgA	102	Biotin	0.2 mg
12115B	550767	Rat Ig (multiple adsorption)	Polyclonal	PE	0.2 mg
12119A	551019	Rat Ig (multiple adsorption)	Polyclonal	APC	0.1 mg

ELISA Kits

04307K	550487	Mouse Immunoglobulin Isotyping ELISA Kit		Kit	80 Samples
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Immunohistochemistry (IHC)/Immunocytochemistry (ICC) Reagents

Human - IHC

75741E	550849	Human Androgen receptor (IHC)	G122-25	Purified	1 ml
75721E	550847	Human Bcl-2 (IHC)	Bcl-2/100	Purified	1 ml
74871E	550404	Human CD106 (VCAM-1) (IHC)	51-10C9	Purified	1 ml
74611E	550373	Human CD11a/LFA-1 (IHC)	HI111	Purified	1 ml
74621E	550374	Human CD11b/Mac-1 (IHC)	ICRF44	Purified	1 ml
74631E	550375	Human CD11c (IHC)	B-ly6	Purified	1 ml
74641E	550376	Human CD14 (IHC)	M5E2	Purified	1 ml
74651E	550382	Human CD15 (IHC)	HI98	Purified	1 ml
74881E	550405	Human CD152 (IHC)	BNI3.1	Purified	1 ml
74661E	550383	Human CD16 (IHC)	3G8	Purified	1 ml
74671E	550384	Human CD19 (IHC)	HIB19	Purified	1 ml
74541E	550366	Human CD1a (IHC)	HI149	Purified	1 ml
74681E	550385	Human CD20 (Cytoplasmic) (IHC)	H1 (FB1)	Purified	1 ml
74691E	550386	Human CD23 (IHC)	M-L233	Purified	1 ml
74701E	550387	Human CD28 (IHC)	CD28.2	Purified	1 ml
74711E	550388	Human CD29 (IHC)	4-Mar	Purified	1 ml
74561E	550368	Human CD3 (IHC)	UCHT1	Purified	1 ml
74551E	550367	Human CD3 (IHC)	HIT3a	Purified	1 ml
74721E	550389	Human CD31 (PECAM-1) (IHC)	WM59	Purified	1 ml
74731E	550390	Human CD34 (IHC)	581	Purified	1 ml
74571E	550369	Human CD4 (IHC)	RPA-T4	Purified	1 ml
74741E	550391	Human CD40 (IHC)	5C3	Purified	1 ml
74751E	550392	Human CD44 (IHC)	G44-26	Purified	1 ml
74761E	550393	Human CD45RA (IHC)	HI100	Purified	1 ml
74771E	550394	Human CD45RO (IHC)	UCHL1	Purified	1 ml

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
74581E	550370	Human CD5 (IHC)	UCHT2	Purified	1 ml
74781E	550395	Human CD56 (IHC)	B159	Purified	1 ml
74791E	550396	Human CD62E (E-selectin) (IHC)	68-5H11	Purified	1 ml
74801E	550397	Human CD62L (L-selectin) (IHC)	DREG-56	Purified	1 ml
74811E	550398	Human CD62P (P-selectin) (IHC)	AK4	Purified	1 ml
74831E	550400	Human CD69 (IHC)	FN50	Purified	1 ml
74591E	550371	Human CD7 (IHC)	M-T701	Purified	1 ml
74601E	550372	Human CD8 (IHC)	HIT8a	Purified	1 ml
74841E	550401	Human CD83 (IHC)	HB15e	Purified	1 ml
74851E	550402	Human CD90 (Thy-1) (IHC)	5E10	Purified	1 ml
74861E	550403	Human CD95 (fas/APO-1) (IHC)	DX2	Purified	1 ml
75671E	550842	Human c-erbB-2	9G6	Purified	1 ml
74901E	550407	Human cutaneous lymphocyte antigen (CLA) (IHC)	HECA-452	Purified	1 ml
75711E	550846	Human Cyclin B1 (IHC)	GNS-1	Purified	1 ml
75701E	550845	Human DCC (intracellular domain) (IHC)	G97-449	Purified	1 ml
75681E	550843	Human eosinophil major basic protein (IHC)	AHE-2	Purified	1 ml
75691E	550844	Human eosinophil peroxidase (IHC)	AHE-1	Purified	1 ml
75661E	550841	Human Fas Ligand	G247-4	Purified	1 ml
74911E	550408	Human HLA-A,B,C (IHC)	G46-2.6	Purified	1 ml
75651E	550840	Human HPV L1 (IHC)	CamVir-1	Purified	1 ml
75001C	550521	Human IFN- γ (ICC)	K3	Purified	0.25 mg
75441E	550609	Human Ki-67 (IHC)	B56	Purified	1 ml
75641E	550839	Human Maspin (IHC)	G167-70	Purified	1 ml
75631E	550838	Human MLH-1 (IHC)	G168-15	Purified	1 ml
74991E	550486	Human MUC1 (IHC)	HMPV.2	Purified	1 ml
74981E	550485	Human MUC2 (IHC)	CCP58.1	Purified	1 ml
75581E	550833	Human p21 (IHC)	6B6	Purified	1 ml
75521E	550827	Purified anti-p21 (IHC)	SX118	Purified	1 ml
75561E	550831	Human p53 (IHC)	DO-7	Purified	1 ml
75571E	550832	Human p53 (IHC)	G59-12	Purified	1 ml
75551E	550830	Human Rb (IHC)	G3-245	Purified	1 ml
75541E	550829	Human VHL (von Hippel Landau protein) (IHC)	Ig32	Purified	1 ml
75531E	550828	Human Wilm's tumor (WT1) (IHC)	2C12.1	Purified	1 ml

Human - ICC

74941C	550417	Human GRO (ICC)	10G4.1	Purified	0.25 mg
23801C	550011	Human IFN- γ (ICC)	B27	Purified	0.25 mg
23751C	550004	Human IL-1 α (ICC)	364-3B3-14	Purified	0.25 mg
23781C	550007	Human IL-1 β (ICC)	AS10	Purified	0.25 mg
23761C	550005	Human IL-4 (ICC)	8D4-8	Purified	0.25 mg
74961C	550419	Human IL-8 (ICC)	G265-8	Purified	0.25 mg
74931C	550416	Human MCP-1 (ICC)	5D3-F7	Purified	1 ml
74951C	550418	Human MIP-1 α (ICC)	11A3	Purified	0.25 mg
74971C	550420	Human RANTES (ICC)	2D5	Purified	0.25 mg
23771C	550006	Human TNF- β (ICC)	359-81-11	Purified	0.25 mg

Mouse - IHC

75131E	550544	Mouse CD102 (ICAM-2) (IHC)	3C4(mIC2/4)	Purified	1 ml
75141E	550545	Mouse CD104 (Integrin β 4 chain) (IHC)	346-11A	Purified	1 ml
75151E	550546	Mouse CD105 (Endoglin) (IHC)	MJ7/18	Purified	1 ml
75161E	550547	Mouse CD106 (VCAM-1) (IHC)	429(MVCAM.A)	Purified	1 ml
75021E	550528	Mouse CD11a (Integrin α L chain) (IHC)	M17/4	Purified	1 ml
74071E	550282	Mouse CD11b (Integrin α M chain) (IHC)	M1/70	Purified	1 ml
74081E	550283	Mouse CD11c (Integrin α x chain) (IHC)	HL3	Purified	1 ml
75171E	550548	Mouse CD144 (VE-Cadherin) (IHC)	11D4.1	Purified	1 ml
74091E	550284	Mouse CD19 (IHC)	1D3	Purified	1 ml
75051E	550531	Mouse CD29 (Integrin β 1 chain) (IHC)	9EG7	Purified	1 ml
75041E	550530	Mouse CD29 (Integrin β 1 chain) (IHC)	HM β 1-1	Purified	1 ml
74001E	550274	Mouse CD31 (PECAM-1) (IHC)	MEC 13.3	Purified	1 ml
75061E	550537	Mouse CD34 (IHC)	RAM34	Purified	1 ml
74011E	550275	Mouse CD3e (IHC)	145-2C11	Purified	1 ml

NEW Products *(continued from page 43)*

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Immunohistochemistry (IHC)/Immunocytochemistry (ICC) Reagents <i>(continued)</i>					
Mouse - IHC					
74031E	550277	Mouse CD3e (IHC)	500A2	Purified	1 ml
74041E	550278	Mouse CD4 (L3T4) (IHC)	H129.19	Purified	1 ml
74051E	550280	Mouse CD4 (L3T4) (IHC)	RM4-5	Purified	1 ml
74101E	550285	Mouse CD40(IHC)	3/23	Purified	1 ml
75071E	550538	Mouse CD44 (Pgp-1, Ly-24) (IHC)	IM7	Purified	1 ml
75081E	550539	Mouse CD45 (LCA, Ly-5) (IHC)	30-F11	Purified	1 ml
74111E	550286	Mouse CD45R/B220 (IHC)	RA3-6B2	Purified	1 ml
75091E	550540	Mouse CD49e (Integrin α 5 chain) (IHC)	5H10-27 (MFR5)	Purified	1 ml
75011E	550522	Mouse CD5 (Ly-1) (IHC)	53-7.3	Purified	1 ml
74121E	550287	Mouse CD54 (ICAM-1) (IHC)	3E2	Purified	1 ml
75101E	550541	Mouse CD61 (Integrin β 3 chain) (IHC)	2C9.G2	Purified	1 ml
74151E	550290	Mouse CD62E (E-selectin) (IHC)	10E9.6	Purified	1 ml
74131E	550288	Mouse CD62L (L-selectin, LECAM-1, Ly-22) (IHC)	MEL-14	Purified	1 ml
74141E	550289	Mouse CD62P (P-selectin) (IHC)	RB40.34	Purified	1 ml
75111E	550542	Mouse CD86 (B7-2) (IHC)	GL1	Purified	1 ml
74061E	550281	Mouse CD8a (Ly-2) (IHC)	53-6.7	Purified	1 ml
75121E	550543	Mouse CD90.2 (Thy 1.2) (IHC)	53-2.1	Purified	1 ml
74191E	550294	Mouse γ δ TCR (IHC)	GL3	Purified	1 ml
75192E	550550	Mouse H-2Kb (IHC)	AF6-88.5	Biotin	1 ml
75212E	550552	Mouse H-2Kk (IHC)	36-7-5	Biotin	1 ml
75232E	550554	Mouse I-Ad (IHC)	AMS-32.1	Biotin	1 ml
74161E	550291	Mouse Ly-6G (Gr-1) (IHC)	RB6-8C5	Purified	1 ml
74171E	550292	Mouse Mac-3 (IHC)	M3/84	Purified	1 ml
75251E	550556	Mouse MAdCAM-1 (IHC)	MECA-367	Purified	1 ml
75241E	550555	Mouse MAdCAM-1 (IHC)	MECA-89	Purified	1 ml
75261E	550563	Mouse Panendothelial Cell Antigen (IHC)	MECA-32	Purified	1 ml
75271E	550564	Mouse PNAd Carbohydrate Epitope (CD62L Ligand) (IHC)	MECA-79	Purified	1 ml
74181E	550293	Mouse TCR β chain (IHC)	H57-597	Purified	1 ml
75281E	550565	Mouse TER-119/Erythroid cells (Ly-76) (IHC)	TER-119	Purified	1 ml
75311E	550568	Mouse/Rat CD49e (integrin α 1) (IHC)	Ha31/8	Purified	1 ml
Mouse - ICC					
75821C	550901	Mouse IL-1 α (ICC)	ALF-161	Purified	0.25 mg
Rat - IHC					
74321E	550307	Rat α β TCR (IHC)	R73	Purified	1 ml
74241E	550299	Rat CD11b/c (IHC)	OX-42	Purified	1 ml
74201E	550295	Rat CD3 (IHC)	G4.18	Purified	1 ml
74251E	550300	Rat CD31 (PECAM-1) (IHC)	TLD-3A12	Purified	1 ml
74211E	550296	Rat CD4 (IHC)	OX-35	Purified	1 ml
74221E	550297	Rat CD4 (IHC)	OX-38	Purified	1 ml
75291E	550566	Rat CD45 (Leukocyte Common Antigen) (IHC)	OX-1	Purified	1 ml
74261E	550301	Rat CD45R (IHC)	HIS24	Purified	1 ml
75301E	550567	Rat CD45RA (IHC)	OX-33	Purified	1 ml
74271E	550302	Rat CD54 (ICAM-1) (IHC)	1A29	Purified	1 ml
75321E	550569	Rat CD61 (integrin β 3) (IHC)	F11	Purified	1 ml
74231E	550298	Rat CD8a (IHC)	OX-8	Purified	1 ml
75341E	550571	Rat CD90 (Thy-1) (IHC)	OX-7	Purified	1 ml
75331E	550570	Rat CD90 (Thy-1) (IHC)	HIS51	Purified	1 ml
75351E	550572	Rat Crry/p65 (IHC)	512	Purified	1 ml
74281E	550303	Rat dendritic cells (IHC)	OX-62	Purified	1 ml
74331E	550308	Rat γ δ TCR (IHC)	V65	Purified	1 ml
74291E	550304	Rat Granulocytes (IHC)	HIS48	Purified	1 ml
75361E	550573	Rat Macrophage subset (IHC)	HIS36	Purified	1 ml
74341E	550309	Rat MAdCAM-1 (IHC)	OST2	Purified	1 ml

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
74301E	550305	Rat mononuclear phagocyte (IHC)	1C7	Purified	1 ml
74311E	550306	Rat NKR-P1A (IHC)	10/78	Purified	1 ml
75371E	550574	Rat RT1B (IHC)	OX-6	Purified	1 ml

Isotype Controls and Second Step Reagents - IHC

74362E	550325	Anti-Rat IgG1/2a (IHC)	G28-5	Biotin	1 ml
74372E	550327	Anti-Rat IgG2b(IHC)	G15-337	Biotin	1 ml
74382E	550329	Anti-Rat IgG2c (IHC)	A92-1	Biotin	1 ml
74392E	550330	Anti-Rat IgM (IHC)	G53-238	Biotin	1 ml
74511E	550342	Anti-Rat IgM, κ isotype control (IHC)	R4-22	Purified	1 ml
74512E	550343	Anti-Rat IgM, κ isotype control (IHC)	R4-22	Biotin	1 ml
74452E	550336	Rat and hamster Ig, K light chain (IHC)	RG7/7.6	Biotin	1 ml
74462E	550337	Anti-Mouse Igs (multiple adsorption) (IHC)	polyclonal	Biotin	1 ml
74402E	550331	Mouse IgG1 (IHC)	A85-1	Biotin	1 ml
74412E	550332	Mouse IgG2a (IHC)	R19-15	Biotin	1 ml
74481E	550339	Mouse IgG2a, κ isotype control (IHC)		Purified	1 ml
74422E	550333	Mouse IgG2b (IHC)	R12-3	Biotin	1 ml
74432E	550334	Mouse IgG3 (IHC)	R40-82	Biotin	1 ml
74501E	550341	Mouse IgG3, κ isotype control (IHC)	J606	Purified	1 ml
74491E	550340	Mouse IgM, κ isotype control (b allotype, KLH) (IHC)	C48-6	Purified	1 ml
74472E	550338	Anti-Rabbit Ig (Human, Mouse & Rat adsorbed) (IHC)		Biotin	1 ml
74442E	550335	Anti-Hamster IgG (cocktail) (IHC)		Biotin	1 ml
74531E	550345	Anti-Hamster IgG isotype control (KLH (IHC))	Ha4/8	Purified	1 ml
74521E	550344	Anti-Hamster IgG isotype control (TNP) (IHC)	A19-3	Purified	1 ml
75451E	550733	Anti-Rabbit Human C5a Receptor (CD88)	C85-2506	Purified	1 ml

Ancillary Reagents

7539KK	550524	BD Retrieval A (pH 6.0)		Buffer	Set
7542KZ	550527	BD Retrieval B (pH 9.5)		Buffer	250mls
7546KK	550803	BrdU <i>In Situ</i> Detection Kit		Kit	50 slides
7578KK	550880	DAB Substrate Kit		Buffer	500 slides
23731E	550009	ICC Diluent Buffer		Buffer	250 mls
23741E	550010	ICC Fixation Buffer		Buffer	100mls
7538KZ	550523	IHC Zinc Fixative		Fixative	1000ml
75477E	550946	Streptavidin-Horseradish Peroxidase Pre-Diluted (SAV-HRP)		HRP	50 ml

Molecular Biology

45674P	559900	hAngio-3 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45691P	550354	hAR RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45744P	550575	hBER-1a RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45730P	550251	hDisR-1 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45685P	559924	hDSBR-2 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45695P	559928	hITG-1 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45696P	550355	hITG-2 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45697P	550356	hITG-3 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45663P	559953	hMKK RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45673P	559870	hMKKK RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45690P	559927	hSOCS RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45735P	550793	hTOX1a RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45736P	550794	hTOX2 RiboQuant Human Multi-Probe Template Set		Template Set	10 rxns
45725P	550250	mBER-1 RiboQuant Mouse Multi-Probe Template Set		Template Set	10 rxns
45726P	550584	mBER-2 RiboQuant Mouse Multi-Probe Template Set		Template Set	10 rxns
45026P	556146	mCK-5 RiboQuant Mouse Cytokine Multi-Probe Template Set		Template Set	10 rxns
45664P	550066	mCK-5b RiboQuant Mouse Cytokine Multi-Probe Template Set		Template Set	10 rxns

NEW Products *(continued from page 45)*

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
Antibodies to Mouse Cell Surface Molecules					
28451D	550532	Mouse 4-1BB Ligand	TKS-1	Purified	0.5 mg
0106TA	550954	Mouse CD4 (L3T4)	RM4-5	PerCP-Cy5.5	0.1 mg
28501A	550797	Mouse CD8b (Ly-3)	H35-17.2	Purified	0.1 mg
28505A	550798	Mouse CD8b (Ly-3)	H35-17.2	PE	0.1 mg
09709A	550261	Mouse CD11c (Integrin α X chain)	HL3	APC	0.1 mg
09659A	550992	Mouse CD19	1D3	APC	0.1 mg
01959A	551262	Mouse CD31	MEC13.3	APC	0.1 mg
28350D	550023	Mouse CD51	RMV-7	NA/LE	0.5 mg
28351A	550024	Mouse CD51	RMV-7	Purified	0.1 mg
28355A	551187	Mouse CD51	RMV-7	PE	0.1 mg
28381A	550268	Mouse CD72 b and c Alloantigens (Lyb-2.2 and Lyb-2.3)	JY/93	Purified	0.1 mg
28385A	550269	Mouse CD72 b and c Alloantigens (Lyb-2.2 and Lyb-2.3)	JY/93	PE	0.1 mg
28242A	550965	Mouse CD51	RMV-7	Biotin	0.1 mg
28241A	550964	Mouse CD72.4 (Ly-19.2, Lyb-2.1, and Lyb-2.2)	K10.6	Purified	0.1 mg
28244A	550966	Mouse CD72.4 (Ly-19.2, Lyb-2.1, and Lyb-2.2)	K10.6	Biotin	0.1 mg
28480D	550739	Mouse CD73	TY/23	NA/LE	0.5 mg
28481A	550738	Mouse CD73	TY/23	Purified	0.1 mg
28485A	550741	Mouse CD73	TY/23	PE	0.1 mg
28491A	550772	Mouse CD94	18d3	Purified	0.1 mg
28492A	550773	Mouse CD94	18d3	Biotin	0.1 mg
23622D	550482	Mouse CD119 (IFN- γ Receptor α chain)	2E2	Biotin	0.5 mg
23652D	550476	Mouse CD120b (TNF Receptor type II [p75])	TR75-89	Biotin	0.5 mg
09282A	550969	Mouse CD121a (IL-2 receptor, type 1/p80)	35F5	Biotin	0.1 mg
28420D	550426	Mouse CD127 (IL-7 Receptor α chain)	SB/14	NA/LE	0.5 mg
28421D	550425	Mouse CD127 (IL-7 Receptor α chain)	SB/14	Purified	0.5 mg
28425B	550479	Mouse CD127 (IL-7 Receptor α chain)	SB/14	PE	0.2 mg
28361A	550058	Mouse Crry/p65	1F2	Purified	0.1 mg
28362A	550059	Mouse Crry/p65	1F2	Biotin	0.1 mg
28431A	550433	Mouse Early B Lineage	493	Purified	0.1 mg
28435A	550441	Mouse Early B Lineage	493	PE	0.1 mg
28432A	550434	Mouse Early B Lineage	493	Biotin	0.1 mg
06391A	550591	Mouse H-2Kb	CS/JeL.1	Purified	0.1 mg
06394A	550592	Mouse H-2Kb	CS/JeL.1	FITC	0.1 mg
28510D	550862	Mouse KLRG1 (MAFA)	2F1	NA/LE	0.5 mg
28511A	550861	Mouse KLRG1 (MAFA)	2F1	Purified	0.1 mg
28512A	550863	Mouse KLRG1 (MAFA)	2F1	Biotin	0.1 mg
28521A	550864	Mouse Ly-49C, F, H, and I	14B11	Purified	0.1 mg
28530D	550985	Mouse Ly-49F	HBF-719	NA/LE	0.5 mg
28522A	550865	Mouse Ly-49C, F, H, and I	14B11	Biotin	0.1 mg
28531A	550984	Mouse Ly-49F	HBF-719	Purified	0.1 mg
28532A	550986	Mouse Ly-49F	HBF-719	Biotin	0.1 mg
28535A	550987	Mouse Ly-49F	HBF-719	PE	0.1 mg
28461A	550579	Mouse Ly-49G2 ^{B6}	Cwy-3	Purified	0.1 mg
28464D	550580	Mouse Ly-49G2 ^{B6}	Cwy-3	FITC	0.5 mg
28465A	550581	Mouse Ly-49G2 ^{B6}	Cwy-3	PE	0.1 mg
28470D	550624	Mouse Ly-49I	YLI-90	NA/LE	0.5 mg
28471A	550593	Mouse Ly-49I	YLI-90	Purified	0.1 mg
28472A	550596	Mouse Ly-49I	YLI-90	Biotin	0.1 mg
28474D	550594	Mouse Ly-49I	YLI-90	FITC	0.5 mg
28475A	550595	Mouse Ly-49I	YLI-90	PE	0.1 mg
01299A	550627	Mouse NK-1.1 (NKR-P1B and NKR-P1C)	PK136	APC	0.1 mg
28441A	550518	Mouse NKG2A/C/E	20d5	Purified	0.1 mg
28442A	550519	Mouse NKG2A/C/E	20d5	Biotin	0.1 mg
28444D	550520	Mouse NKG2A/C/E	20d5	FITC	0.5 mg
28371D	550081	Mouse NK-T/NK Cell Antigen	U5A2-13	Purified	0.5 mg
28375B	550082	Mouse NK-T/NK Cell Antigen	U5A2-13	PE	0.2 mg
09949A	550991	Mouse Pan-NK Cells	DX5	APC	0.1 mg
28401A	550348	Mouse PIR-A/B	6C1	Purified	0.1 mg

Cat. No.	New Cat. No.	Specificity	Clone	Format	Size
28405A	550349	Mouse PIR-A/B	6C1	PE	0.1 mg
28411A	550350	Mouse Syndecan 4	KY/8.2	Purified	0.1 mg
28412A	550351	Mouse Syndecan 4	KY/8.2	Biotin	0.1 mg
28415A	550352	Mouse Syndecan 4	KY/8.2	PE	0.1 mg
28391A	550320	Mouse TRAIL	N2B2	Purified	0.1 mg

Antibodies to Rat Cell Surface Molecules

22735A	550353	Rat CD3	1F4	PE	0.1 mg
22739A	557030	Rat CD3	1F4	APC	0.1 mg
22941A	551133	Rat CD24	HIS50	Purified	0.1 mg
22604A	550973	Rat CD28	JJ319	FITC	0.1 mg
22029A	550057	Rat CD4	OX-35	APC	0.1 mg
22502A	550970	Rat CD8b	341	Biotin	0.1 mg
22545A	550972	Rat CD11a (Integrin α L chain, LFA-1 α chain)	WT.1	Purified	0.1 mg
22930D	551122	Rat CD73	5F/B9	NA/LE	0.5 mg
22931A	551123	Rat CD73	5F/B9	Purified	0.1 mg
22935A	551124	Rat CD73	5F/B9	PE	0.1 mg
22880D	550273	Rat CD32 (Fc γ II receptor)	D34-485	NA/LE	0.5 mg
22881A	550270	Rat CD32 (Fc γ II receptor)	D34-485	Purified	0.1 mg
22881D	550271	Rat CD32 (Fc γ II receptor)	D34-485	Purified	0.5 mg
22884D	550272	Rat CD32 (Fc γ II receptor)	D34-485	FITC	0.5 mg
22114A	550974	Rat CD44 H(Pgp-1, H-CAM)	OX-49	FITC	0.1 mg
22914A	550802	Rat CD45.1 (RT7.1 of LCA)	NDS58	FITC	0.1 mg
22724A	550976	Rat CD59 (MAC inhibitor)	TH9	FITC	0.1 mg
22042A	550977	Rat CD134 (OX-40 Antigen)	OX-40	Biotin	0.1 mg
22642A	550978	Rat CD161a (NKR-P1A)	10/78	Biotin	0.1 mg
22921A	550961	Rat Erythroid Cells	HIS49	Purified	0.1 mg
22922A	550962	Rat Erythroid Cells	HIS49	Biotin	0.1 mg
22251A	550979	Rat Pan-T Cells	OX-52	Purified	0.1 mg
22302A	550980	Rat RT1A	OX-18	Biotin	0.1 mg
22354A	550981	Rat RT1Aa,b	C3	FITC	0.1 mg
22344A	550982	Rat RT1D	OX-17	FITC	0.1 mg
22892A	550721	Rat V β 13 TCR	18B1	Biotin	0.1 mg
22902A	550731	Rat V β 3.3 TCR	C-A11	Biotin	0.1 mg

Other Animal Model Reagents

07112A	550427	Dog CD34	2E9	Biotin	0.1 mg
07141A	550080	Guinea pig MHC Class I	HUSM-20	Purified	0.1 mg
07151A	550471	Guinea pig Mononuclear Cells	HUSM-28	Purified	0.1 mg
07672A	551305	Pig CD8a	76-2-11	Biotin	0.1 mg
07674A	551303	Pig CD8a	76-2-11	FITC	0.1 mg
07791A	551306	Pig CD18 (Integrin β 2 chain)	PNK-I	Purified	0.1 mg
07161A	550481	Guinea pig T Lymphocytes	HUSM-33	Purified	0.1 mg
07171A	550766	Pig CD62E (E-selectin)	1.2B6	Purified	0.1 mg
2663KI	559345	Pig IFN- γ OptEIA Set		Set	Rgts for 20 plates
23602D	559958	Pig IFN- γ	P2C11	Biotin	0.5 mg
20451A	559856	Pig IFN- γ	P2G10	Purified	0.1 mg
20451D	559961	Pig IFN- γ	P2G10	Purified	0.5 mg
20455A	559812	Pig IFN- γ	P2G10	PE	0.1 mg
23835A	550074	Rabbit IL-8	2g3.2	PE	0.1 mg
23831A	550075	Rabbit IL-8	2g3.2	Purified	0.1 mg
07371D	551002	Rabbit II/135 antigen	L11/135	Purified	0.5 mg

Where We'll Be in Spring 2001

When	What	Where
March	EMS - Environmental Mutagen Society	San Diego, CA
	Experimental Biology 2001	Orlando, FL
April	BioResearch Product Fair, Washington University	St. Louis, MO
May	FOCIS (Federation of Clinical Immunology Societies)	Boston, MA
	SALK Institute	San Diego, CA
June	BioResearch Product Fair, University of California	Berkeley, CA
	ISHAGE - Int'l Society for Hematotherapy and Graft Engineering	Quebec, Canada
	CLMA - Clinical Lab Managers Association	St. Louis, MO
	BIO 2001	San Diego, CA
	National Flow Cytometry Course Research	Los Alamos, NM

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