

# eFluor® Organic Dyes

Optimized Reagents for Multicolor Flow Cytometry

eFluor® is the eBioscience brand of fluorochromes for labeling and detection of biomolecules. eFluor® Organic Dyes is a growing product line of fluorescent dyes within the eFluor® brand that have been engineered for superior optical performance in multicolor flow cytometry applications. Our eFluor® Organic Dyes include four dyes that are compatible with the laser lines available on standard flow cytometers:

- **eFluor® 450:** an organic dye, excited with the violet (405 nm) laser, which replaces Pacific Blue® in the eBioscience portfolio.
- **PerCP-eFluor® 710:** a tandem dye that is excited with the blue (488 nm) laser and is two to three-fold brighter than PerCP-Cy5.5.
- **eFluor® 660:** an organic dye, excited with the red (633 nm) laser and an alternative dye option to APC or Alexa Fluor® 647.
- **APC-eFluor® 780:** a tandem dye, excited by the red (633 nm) laser, which replaces APC-Alexa Fluor® 750 in the eBioscience portfolio.

All eFluor® products are named for their emission wavelength. eFluor® Organic Dyes are fully compatible with protein-based dyes, organic dyes and eFluor® nanocrystal reagents. This feature, combined with our broad portfolio of biological content, provides maximum choice when designing optimized multicolor staining panels for flow cytometry.

## FEATURING

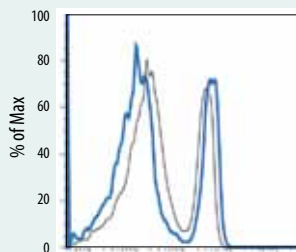
### ORGANIC DYES

- eFluor® 450
- eFluor® 660
- PerCP-eFluor® 710
- APC-eFluor® 780

eFluor®  
ORGANIC DYES

## eFluor® Organic Dyes

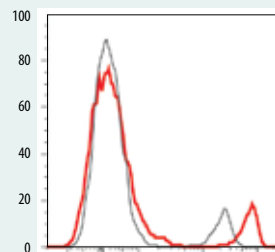
### eFluor® 450



CD4 (clone RM4-5)

Mouse splenocytes were stained with anti-CD4 (clone RM4-5) conjugated to eFluor® 450 (—) or Pacific Blue® (—)

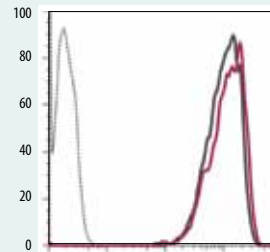
### PerCP-eFluor® 710



CD8 (clone 53-6.7)

Mouse splenocytes were stained with anti-CD8 (clone 53-6.7) conjugated to PerCP-eFluor® 710 (—) or PerCP-Cy5.5 (—)

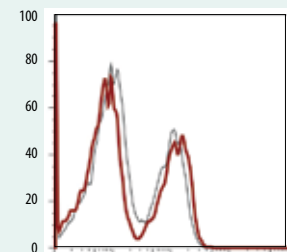
### eFluor® 660



CD36 (clone NL07)

Human monocytes were stained with anti-CD36 (clone NL07) conjugated to eFluor® 660 (Red) or Alexa Fluor® 647 (Grey). Isotype control staining is shown with the grey dotted line.

### APC-eFluor® 780



CD3 (clone 17A2)

Mouse splenocytes were stained with anti-CD3 (clone 17A2) conjugated to APC-eFluor® 780 (—) or APC-Alexa Fluor® 750 (—)

## Alternative for:

Pacific Blue®  
VioBlue  
BD Horizon™ V450

PerCP-Cy5.5

Alexa Fluor® 647  
APC

APC-Alexa Fluor® 750  
APC-H7  
APC-Cy7

## eFluor® 450

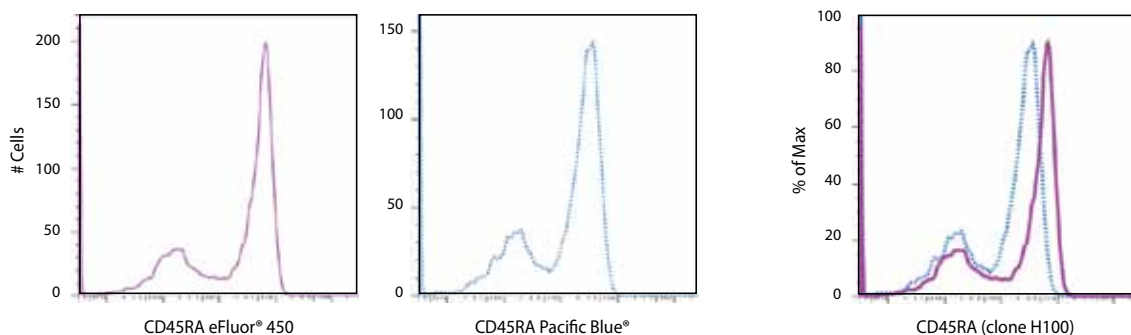
Excitation: Violet (405 nm) laser

Emission Peak: 450 nm

The eFluor® 450 organic dye was developed to provide a high performance fluorochrome for multicolor flow cytometry and is a competitive alternative for Pacific Blue® and other violet laser excited dyes that emit in this range. The benefits of eFluor® 450 include:

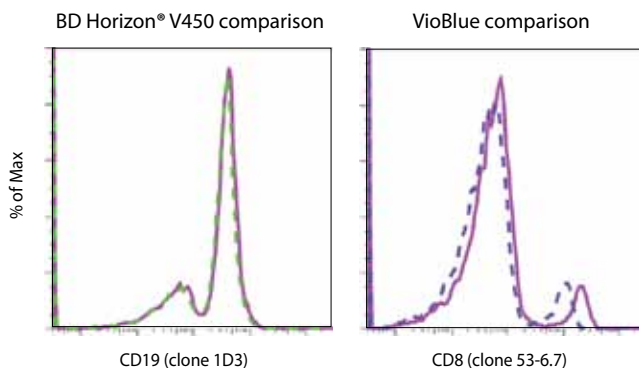
- Equal or better fluorescence intensity compared to Pacific Blue®
- Improved performance compared with other commercial 450 nm emitting dyes
- Stable performance when treated with aldehyde fixation

### eFluor® 450 replaces Pacific Blue®



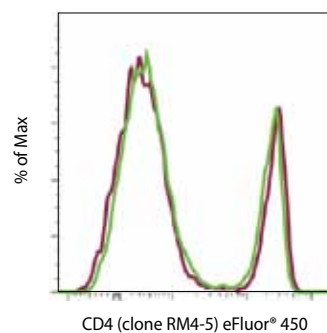
Human PBMCs were stained with anti-CD45RA clone HI100 conjugated to eFluor® 450 (left panel) or Pacific Blue® (middle panel). The right panel shows the overlay of both histograms.

### eFluor® 450 is competitive with other 450 nm emitting dyes



Mouse splenocytes were stained with anti-CD19 (clone 1D3) conjugated to eFluor® 450 (—) or BD Horizon® V450 (---) (left panel). Mouse splenocytes were stained with anti-CD8 (clone 53-6.7) conjugated to eFluor® 450 (—) or VioBlue (---) (right panel).

### Stability of eFluor® 450



Mouse splenocytes were stained with anti-CD4 eFluor® 450 and analyzed immediately (—). The sample was then fixed in 2% paraformaldehyde overnight at 4°C (---) and analyzed again.

## Recommended filters for eBioscience eFluor® Organic Dyes

Fluorochrome	Excitation Laser (nm)	Emission Maximum (nm)	Dichroic Mirror	Band Pass Filter
eFluor® 450	405, 407	450	--	450/50
PerCP-eFluor® 710	488	710	685 LP	710/40*, 695/40,
eFluor® 660	633	660	--	620/20
APC-eFluor® 780	633, 635, 640	780	740 LP	780/60

\*recommended

## PerCP-eFluor® 710

Excitation: Blue (488 nm) laser

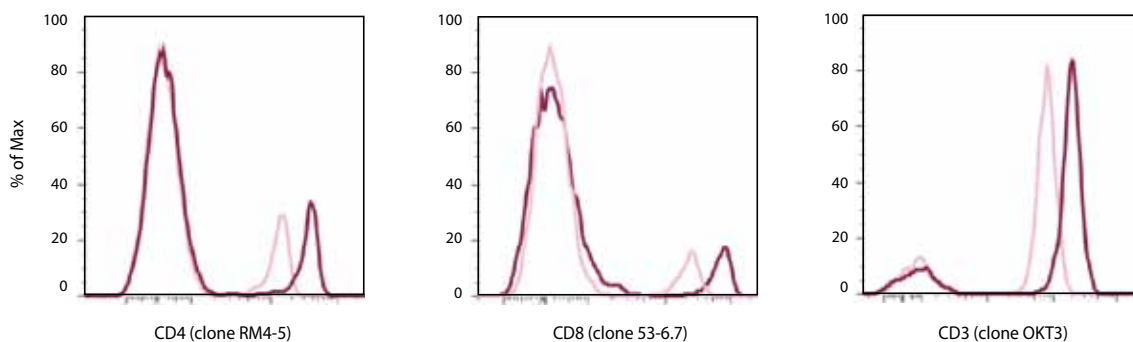
Emission Peak: 710 nm

The PerCP-eFluor® 710 has been developed as an alternative choice for the FL3 channel on a blue laser line. The benefits of PerCP-eFluor® 710 include:

- Greater mean fluorescence intensity (MFI) compared to PerCP-Cy5.5
- No need for compensation out of the PE detector
- Uses same filter sets as PerCP-Cy5.5 and PE-Cy5.5
- Stable performance when treated with aldehyde fixation or exposed to ambient light

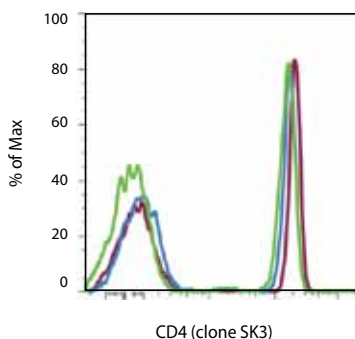
PerCP-eFluor® 710 is consistently two to three times brighter than PerCP-Cy5.5 when evaluated in clone to clone comparison tests on identical tissue samples. Additionally, in contrast to the PE-Cy5.5 tandem, PerCP-eFluor® 710 does not exhibit fluorescence spillover into the PE detector and therefore requires no compensation out of that detector. Although PerCP-eFluor® 710 is slightly red-shifted in its emission compared to PerCP-Cy5.5 (710 nm compared to 685 nm), it uses the same filter sets as those recommended for PerCP-Cy5.5 and PE-Cy5.5 detection thereby requiring no changes to instrumentation for customers currently using PerCP-Cy5.5 or PE-Cy5.5 tandem dye conjugates. Stability testing of PerCP-eFluor® 710 conjugates indicate that they are very stable as evidenced by minimal effects on compensation following six hours of exposure to ambient light or overnight fixation in 2% paraformaldehyde at 4°C.

### PerCP-eFluor® 710 exhibits a significant increase in MFI compared to PerCP-Cy5.5



Anti-mouse CD4 (clone RM4-5), anti-mouse CD8 (clone 53-6.7), and anti-human CD3 (clone OKT3) were conjugated to either PerCP-eFluor® 710 (—) or PerCP-Cy5.5 (—) for direct comparison. Mouse splenocytes were stained with anti-CD4 (left panel) or anti-CD8 (middle panel). Human PBMCs were stained with anti-CD3 (right panel).

### PerCP-eFluor® 710 is minimally affected by fixation or light exposure



Human PBMCs were stained with anti-CD4 PerCP-eFluor® 710 and analyzed immediately (—). The sample was then divided and either exposed to ambient light for 6 hours on the benchtop (—) or fixed in 2% paraformaldehyde overnight at 4°C (—) and analyzed again.

#### Compensation Values

- % PerCP-eFluor® 710 signal

Detector	Fresh cells	6 hours-ambient light exposure	2% paraformaldehyde fixation
PE-Cy7	16.2	16.5	16
Alexa Fluor® 700	10.2	10.4	10.5
APC-eFluor® 780	4.6	4.9	4.8

# APC-eFluor® 780

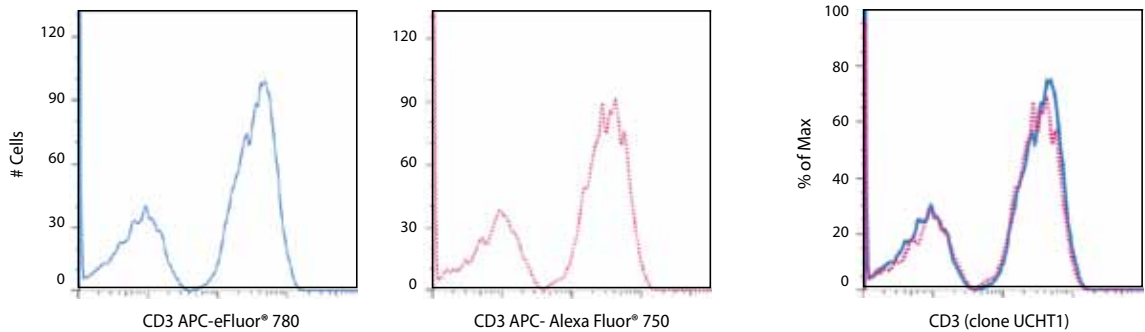
Excitation: Red (633 nm) laser  
Emission Peak: 780 nm

APC-eFluor® 780 has similar spectral properties to APC-Alexa Fluor® 750, APC-H7, and APC-Cy7 and can be used in place of any of these tandem dyes when designing a multicolor staining panel. The benefits of APC-eFluor® 780 include:

- Equal or better fluorescence intensity compared to APC-Alexa Fluor® 750
- Brighter than APC-H7 tandem conjugates
- Stable performance when treated with aldehyde fixation or exposed to ambient light
- Uses same filter sets as APC-Alexa Fluor® 750

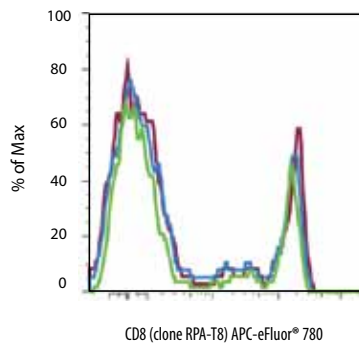
We have replaced our previous APC-Alexa Fluor® 750 conjugated antibodies with APC-eFluor® 780 following validation criteria of equal or better performance for each clone. The APC-eFluor® 780 tandem dye can be easily compensated when used with APC and thus offers a quality reagent for use in multicolor staining panels.

## APC-eFluor® 780 replaces APC-Alexa Fluor® 750



Human PBMCs were stained with anti-CD3 clone UCHT1 conjugated to APC-eFluor® 780 (left panel) or APC-Alexa Fluor® 750 (middle panel). The right panel shows the overlay of both histograms.

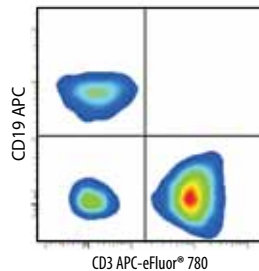
## Stability of APC-eFluor® 780



Compensation Values			
- % APC-eFluor® 780 signal			
Detector	Fresh cells	6 hours-ambient light exposure	2% paraformaldehyde fixation
PE-Cy7	1.3	1.4	1.3
APC	14.2	18.6	14.4
Alexa Fluor® 700	2.3	3	2.3

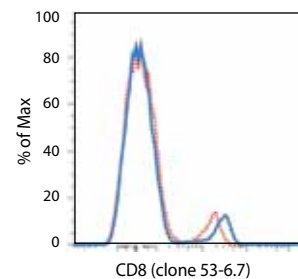
Human PBMCs were stained with anti-CD8 APC-eFluor® 780 and analyzed immediately ( — ). The sample was then divided and either exposed to ambient light for 6 hours on the benchtop ( — ) or fixed in 2% paraformaldehyde for 30 minutes at room temperature ( — ).

## Easy to use with APC



Human PBMCs were stained with anti-CD3 (clone UCHT1) conjugated to APC-eFluor® 780 and anti-CD19 (clone H1B19) APC.

## Comparison with APC-H7

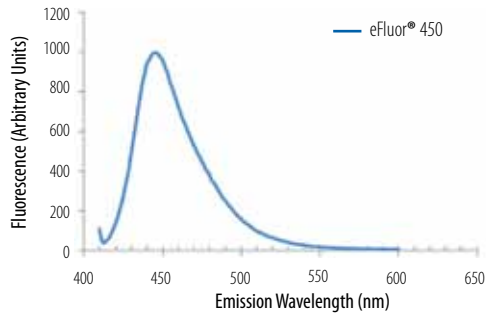


Mouse splenocytes were stained with anti-CD8 (clone 53-6.7) conjugated to APC-eFluor® 780 ( — ) or APC-H7 ( — ).

## Emission Spectra

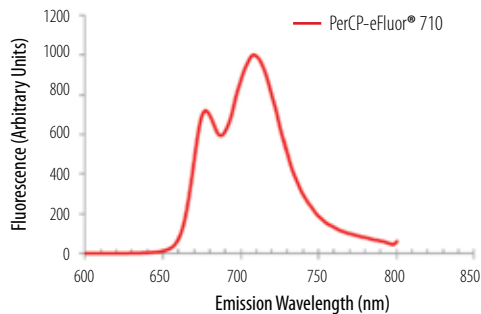
### eFluor® 450 Organic Dye

The graph shows the emission spectra of an eFluor® 450 conjugated antibody. A 450/50 band pass filter is recommended for this fluorochrome.



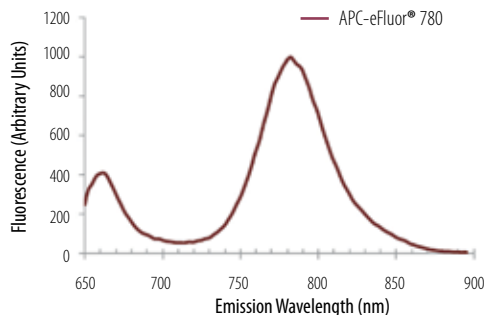
### PerCP-eFluor® 710 Organic Dye

The graph shows the emission spectra of a PerCP-eFluor® 710 conjugated antibody. For this fluorochrome, a 685 nm long pass filter is recommended along with a 710/40 band pass filter. A 695/40 band pass filter is an acceptable alternative.



### APC-eFluor® 780 Organic Dye

The graph shows the emission spectra of an APC-eFluor® 780 conjugated antibody. A 740 nm long pass filter is recommended along with a 780/60 band pass filter for detection of this fluorochrome.



## Mouse Antibodies

Description	Cat. No.	Clone	Violet Laser	Blue Laser	Red Laser	
			eFluor® 450	PerCP-eFluor® 710	eFluor® 660	APC-eFluor® 780
CD3	0032	17A2	•	•	•	•
CD4	0041	GK1.5	•	•	•	•
	0042	RM4-5	•	•	•	•
CD5	0051	53-7.3	•	•	•	•
CD8	0081	53-6.7	•	•	•	•
CD11b	0112	M1/70	•	•	•	•
CD11c	0114	N418	•	•	•	•
CD16/32	0161	93	•	•	•	•
CD19	0193	1D3	•	•	•	•
CD21/35	0212	4.00E+03	•	•	•	•
CD24 (HSA)	0242	M1/69	•	•	•	•
CD25 (IL-2Ra)	0251	PC61.5	•	•	•	•
CD27	0271	LG.7F9	•	•	•	•
CD31 (PECAM-1)	0311	390	•	•	•	•
CD34	0341	RAM34	•	•	•	•
CD41	0411	MWRReg30	•	•	•	•
CD44	0441	IM7	•	•	•	•
CD45R (B220)	0452	RA3-6B2	•	•	•	•
CD45	0451	30-F11	•	•	•	•
CD45.1	0453	A20	•	•	•	•
CD45.2	0454	104	•	•	•	•
CD62L (L-selectin)	0621	MEL-14	•	•	•	•
CD73	0731	TY/11.8	•	•	•	•
CD83	0831	Michel-17	•	•	•	•
CD90.1	0900	HIS51	•	•	•	•
CD90.2	0902	53-2.1	•	•	•	•
CD106 (VCAM-1)	1061	429	•	•	•	•
CD117 (c-Kit)	1171	2B8	•	•	•	•
CD122 (IL-2Rβ)	1222	TM-b1	•	•	•	•
CD127 (IL-7Ra)	1271	A7R34	•	•	•	•
CD135 (Flt3)	1351	A2F10	•	•	•	•
CD144 (VE-Cadherin)	1441	BV13	•	•	•	•
CD154 (CD40 Ligand)	1541	MR1	•	•	•	•
CD197 (CCR7)	1971	4B12	•	•	•	•
CD205 (DEC205)	2051	205yekta	•	•	•	•
CD324 (E-Cadherin)	3249	DECMA-1	•	•	•	•
CD326 (EpcAM)	5791	G8.8	•	•	•	•
CD335 (NKp46)	3351	29A1.4	•	•	•	•
Clec9A	5975	42D2	•	•	•	•
F4/80	4801	BM8	•	•	•	•
Foxp3	5773	FJK-16s	•	•	•	•
GARP	9891	YGIC86	•	•	•	•
γδ TCR	5711	GL3	•	•	•	•
GITR	5874	DTA-1	•	•	•	•
IFNγ	7311	XMG1.2	•	•	•	•
IL-2	7021	JES6-5H4	•	•	•	•
IL-17F	7471	18F10	•	•	•	•
IL-21	7211	FFA21	•	•	•	•
IL-22	7221	IH8PWSR	•	•	•	•
IL-23	7023	fc23cpg	•	•	•	•
Ki67	5698	SolA15	•	•	•	•
KLRG1	5893	2F1	•	•	•	•
Ly-6G (Gr-1)	5931	RB6-8C5	•	•	•	•
Ly-49E/F	5848	CM4	•	•	•	•
Ly-49G2	5781	4D11	•	•	•	•
LYVE-1	0443	ALY7	•	•	•	•
MHC Class I (H-2Kb)	5958	AF6-88.5.5.3	•	•	•	•
MHC Class I H-2Dd	5947	34-2-12	•	•	•	•
MHC Class I (H-2Kd)	5957	SF1-1.1.1	•	•	•	•
MHC Class I/SIINFEKL	5743	25-D1.16	•	•	•	•
MHC Class II (I-A/I-E)	5321	M5/114.15.2	•	•	•	•
MHC Class II I-Ab	5320	AF6-120.1	•	•	•	•
NKp46	3351	29A1.4	•	•	•	•
ROR gamma (t)	6981	B2D	•	•	•	•
Siglec-H	0333	440c	•	•	•	•
TCR-β	5961	H57-597	•	•	•	•
TER-119	5921	TER-119	•	•	•	•
TNF-α	7321	MP6-XT22	•	•	•	•

**Human Antibodies**

Description	Cat. No.	Clone	Violet Laser	Blue Laser	Red Laser	
			eFluor® 450	PerCP-eFluor® 710	eFluor® 660	APC-eFluor® 780
Bcl-6	9880	BCL-UP		•		
CD1d	0016	51.1		•		
CD3	0036	SK7	•	•		•
	0037	OKT3	•	•		
	0038	UCHT1	•			•
CD4	0047	SK3	•	•		•
	0049	RPA-T4	•			•
CD5	0059	UCHT2		•		
CD7	0078	4H9		•		
CD8	0088	RPA-T8	•			•
	0087	SK1	•	•		•
CD10 (CALLA)	0108	SN5c		•		
CD11b	0118	ICRF44		•		•
CD13	0138	WM15		•		
CD14	0149	61D3	•	•		•
CD15	0159	HI98	•	•		
	0158	MMA	•	•		
CD16	0168	CB16	•	•		
CD19	0199	HIB19	•			•
	0198	SI25C1	•	•		•
CD20	0209	2H7	•	•		•
CD24	0247	SN3		•		•
CD25	0259	BC96	•			•
CD27	0279	O323	•	•		•
	0271	LG.7F9	•	•		•
CD29 (Integrin β1)	0299	TS2/16		•		
CD31	0319	WM59	•	•		•
CD33	0337	P67.6	•	•		
CD36	0369	NL07			•	
CD34	0349	4H11	•	•		
CD38	0388	HB7	•	•		•
CD40	0409	5C3	•	•		
CD41	0159	HIP8	•	•		
CD44	0441	IM7	•			•
CD45	9459	2D1	•			•
	0459	HI30	•	•		•
CD45R (B220)	0452	RA3-6B2	•	•		•
CD45RA	0458	HI100	•			•
CD45RO	0457	UCHL1	•	•		
CD47	0479	B6H12		•		
CD56	0567	CMSSB		•		•
CD57	0577	TBO1	•			•
CD62L (L-selectin)	0629	DREG-56	•	•		•

**Human Antibodies**

Description	Cat. No.	Clone	Violet Laser	Blue Laser	Red Laser	
			eFluor® 450	PerCP-eFluor® 710	eFluor® 660	APC-eFluor® 780
CD73	0739	AD2		•		
CD85d (ILT4)	5149	42D1		•		
CD85j (ILT2)	5129	HP-F1		•		
CD85k (ILT3)	5139	ZM4.1		•		
CD95 (Fas/APO-1)	0959	Dx2	•	•		
CD117 (c-Kit)	1178	104D2	•	•		
CD123 (IL-3Ra)	1239	6H6	•			
CD127 (IL-7Ra)	1278	RDR5	•			•
CD144 (VE-Cadherin)	1449	16B1		•		
CD154 (CD40L)	1548	24-31	•	•		•
CD162 (PSGL-1)	1629	FLEG		•		
CD166 (ALCAM)	1668	3A6		•		
CD197 (CCR7)	1979	3D12		•		•
CD201 (EPCR)	2012	1560		•		
CD206 (MMR)	2069	19.2	•	•		
CD235a	9987	HIR2		•		
CD278	9948	ISA-3	•	•		
CD324 (E-Cadherin)	3249	DECMA-1		•		
CD325 (N-Cadherin)	3259	8C11		•		
CD326 (EpCAM)	9326	1B7		•	•	
Cx3CR1	6099	2A9-1		•		
Foxp3	4776	PCH101	•		•	
	4777	236A/E7	•			
Gata-3	9966	TWAJ		•	•	
G-CSF	7351	8F5CSF			•	
Glycophorin A (M)	9884	6A7M	•			
HLA-DR	9952	L243	•	•		
	9956	LN3	•			•
IL-2	7029	MQ1-17H12		•		
IL-8	8088	8CH	•	•		
IL-10	7108	JES3-9D7	•			
IL-12/IL-23 p40	7235	HP40		•	•	
IL-12/IL-23 p40/70	7129	C8.6	•			
IL-17A	7179	64DEC17	•			•
IL-21	7219	3A3-N2			•	
IL-22	7229	22URTI		•	•	
IL-23p19	7823	23dcdp			•	
Ki67	5699	20Raj1	•	•		
PD-1	2799	J105		•		
Perforin	9994	dG9		•		
T-bet	5825	4B10			•	
TSLP Receptor	5499	1A6		•		
Va24Ja18 TCR	5806	6B11		•	•	

**Kits and Support Products**

Description	Cat. No.	Violet Laser	Blue Laser	Red Laser	
		eFluor® 450	PerCP-eFluor® 710	eFluor® 660	APC-eFluor® 780
Annexin V Apoptosis Detection Kit	8006	•			
	8008		•		
Armenian Hamster IgG Isotype Control	4888	•	•		•
Golden Syrian Hamster IgG Isotype Control	4914	•	•		
Mouse IgG1 Isotype Control	4714	•	•	•	•
Mouse IgG2a Isotype Control	4724	•	•	•	•
Mouse IgG2b Isotype Control	4732	•	•	•	•
Mouse IgM Isotype Control	4752	•		•	
Rat IgG1 Isotype Control	4301	•	•	•	•
Rat IgG2a Isotype Control	4321	•	•	•	•
Rat IgG2b Isotype Control	4031	•	•	•	•
Streptavidin	4317	•	•		•
Rat IgG2b Isotype Control	4031	•	•	•	•
Streptavidin	4317	•	•		•

Discover more at [www.eBioscience.com](http://www.eBioscience.com)