Optical Filter Patterns

The detection module takes the scattered and fluorescent light collected from cells and separates it into eight channels of light, comprising the forward scatter channel, back scatter channel, and six channels of fluorescent light of various wavelengths. The SH800 uses a combination of longpass optical filters (in slots labeled LP1 to LP5) and bandpass optical filters (in slots labeled BSC, FSC, and FL1 to FL6) arranged in an optically optimized layout, according to the laser configuration for an experiment.

The SH800 uses two standard optical filter patterns.

Optical filters	Optical filter pattern 1*1	Optical filter pattern 2*2
LP1	639LP	639LP
LP2	600LP	561LP
LP3	561LP	487.5LP
LP4	752LP	752LP
LP5	685LP	685LP
FL1	525/50	450/50
FL2	585/30	525/50
FL3	617/30	600/60
FL4	665/30	665/30
FL5	720/60	720/60
FL6	785/60	785/60
FSC	488/17F	488/17F
BSC	488/17B	488/17B

*1. On the following models, dummy filters are installed in the RESERVE slots.
SH800AC, SH800BC, SH800DC, SH800ZA, SH800ZB, SH800ZD, SH800ZH, SH800ZAP, SH800ZBP, SH800ZDP, SH800ZHP

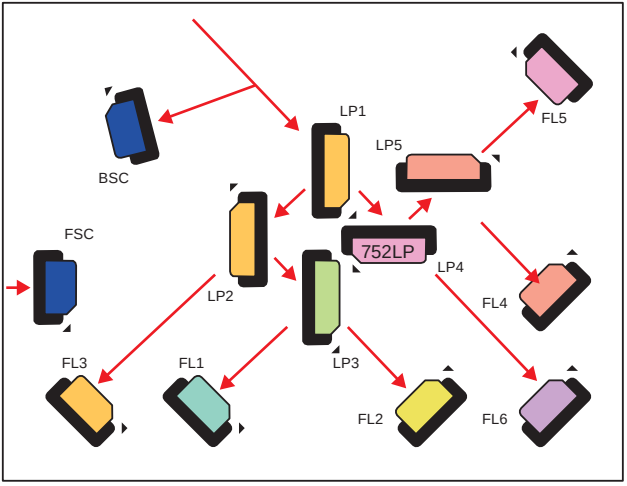
*2. On the following models, filters not used in the current optical filter pattern should be stored in the RESERVE slots. Filter pattern 1 can also be used when the 405 nm laser is turned off to make efficient use of the six fluorescence detection channels.
SH800CC, SH800EC, SH800FC, SH800ZC, SH800ZE, SH800ZF, SH800ZG, SH800ZCP, SH800ZEP, SH800ZFP, SH800ZGP
- Filter pattern 1 can also be used when the 405 nm laser is turned off to make efficient use of the six fluorescence detection channels.
- The shaded portion of the table indicates the filters that are different between optical filter patterns 1 and 2.

Tips

- Optic filter pattern 2 is used only on the following models equipped with a 405 nm laser.
  SH800CC, SH800EC, SH800FC, SH800ZC, SH800ZE, SH800ZF, SH800ZG, SH800ZCP, SH800ZEP, SH800ZFP, SH800ZGP
  Models other than the above use optic filter pattern 1 only.
- The longpass optical filters are bigger than the bandpass optical filters to prevent the accidental insertion of optical filters in the wrong slots. The LP1 to LP5 longpass optical filters are labeled with the wavelength rating of the optical filter and an "LP" suffix (e.g. "639LP" for 639 nm longpass optical filter). The FL1 to FL6 bandpass optical filters are

labeled with the center wavelength of the optical filter and the bandwidth of the optical filter (e.g. "525/50" for 525 nm bandpass optical filter 50 nm bandwidth). The FSC and BSC bandpass optical filter labels have an "F" and "B" suffix, respectively (e.g. "488/17F" for 488 nm bandpass optical filter with 17 nm bandwidth for forward scatter detection).

- Optical filters not used in the current filter pattern can be stored in the RESERVE 1 to 3 slots.



600LP
685LP
720/60
561LP 639LP
585/30
665/30
785/60

Optical Filter Pattern 1

Tips

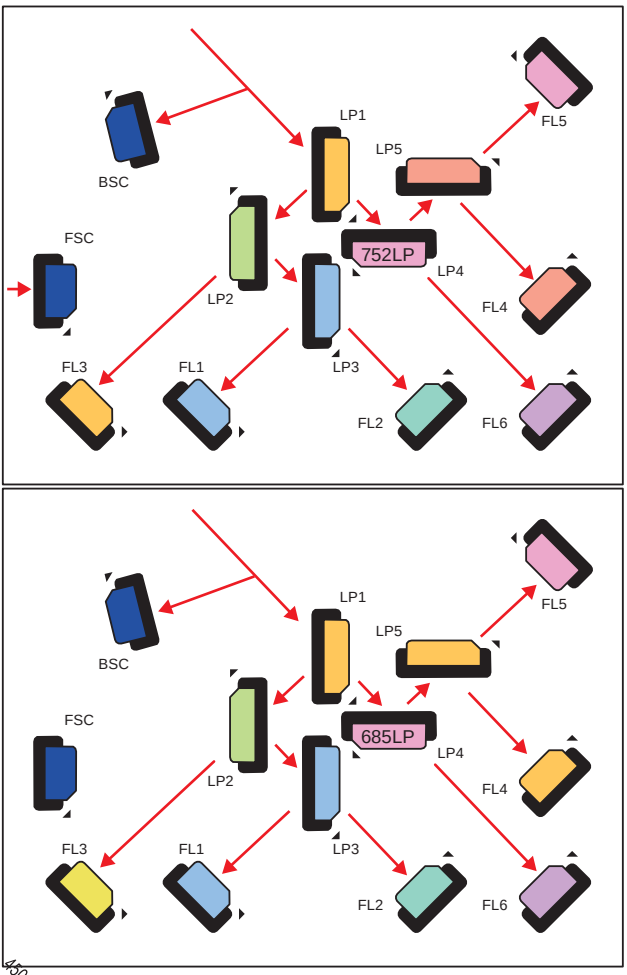
Optical filter label	Installed optical filter
LP1	639LP
LP2	600LP
LP3	561LP
LP4	752LP
LP5	685LP
FL1	525/50
FL2	585/30
FL3	617/30
FL4	665/30
FL5	720/60
FL6	785/60
FSC	488/17F
BSC	488/17B

685LP
720/60
639LP

Optical Filter Pattern 2

Optical filter label	Installed optical filter
LP1	550LP
LP2	525LP
LP3	495LP
LP4	725LP
LP5	605LP
FL1	450/50

FL2	510/20
FL3	535/30
FL4	585/40
FL5	640/30
FL6	785/60
FSC	488/17F
BSC	488/17B



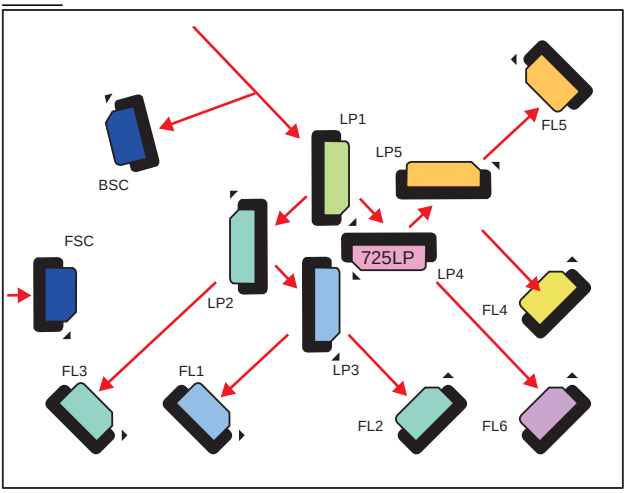
450/50
600/60
561LP 561LP 639LP
665/30
600LP 487.5LP
525/50
665/30
785/60

Filter Pattern for BV/PE/PI

Optical filter label	Installed optical filter
LP1	639LP
LP2	561LP
LP3	487.5LP
LP4	752LP
LP5	685LP
FL1	450/50

FL2	525/50
FL3	600/60
FL4	665/30
FL5	720/60
FL6	785/60
FSC	488/17F
BSC	488/17B

Fluorescent Protein Optical Filter



Pattern (Option)

Optical filter label	Installed optical filter
LP1	600LP
LP2	561LP
LP3	487.5LP
LP4	685LP
LP5	639LP
FL1	450/50
FL2	525/50

FL3	585/30
FL4	617/30
FL5	665/30
FL6	785/60
FSC	488/17F
BSC	488/17B

Fluorochrome Detection Matrix

1 laser (488 nm), optical filter pattern 1

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
488 nm laser	EGFP (Enhanced GFP)	508	FL1 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL1 (525/50)
	FITC	518	FL1 (525/50)
	Alexa Fluor 488	519	FL1 (525/50)
	EYFP (Enhanced YFP)	527	FL1 (525/50)
	mCitrine	529	FL1 (525/50)
	PE (R-Phycoerythrin)	576	FL2 (585/30)
	PE-Texas Red	615	FL3 (617/30)
	PI (Propidium Iodide)	617	FL3 (617/30)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)

2 lasers (488 and 638 nm lasers), optical filter pattern 1

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
488 nm laser	EGFP (Enhanced GFP)	508	FL1 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL1 (525/50)
	FITC	518	FL1 (525/50)
	Alexa Fluor 488	519	FL1 (525/50)
	EYFP (Enhanced YFP)	527	FL1 (525/50)
	mCitrine	529	FL1 (525/50)
	PE (R-Phycoerythrin)	576	FL2 (585/30)
	PE-Texas Red	615	FL3 (617/30)
	PI (Propidium Iodide)	617	FL3 (617/30)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)
638 nm laser	APC (Allophycocyanin)	660	FL4 (665/30)
	Cy5	670	FL4 (665/30)
	Alexa Fluor 647	668	FL4 (665/30)
	APC-Cy5.5	695	FL5 (720/60)
	Alexa Fluor 700	719	FL5 (720/60)
	APC-Cy7	779	FL6 (785/60)
	APC-Alexa Fluor 750	775	FL6 (785/60)

2 lasers (405 and 488 nm lasers), optical filter pattern 2

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
405 nm laser	Brilliant Violet 421	421	FL1 (450/50)
	Alexa Fluor 405	421	FL1 (450/50)
	DAPI	455	FL1 (450/50)
	Pacific Blue	455	FL1 (450/50)
	mCFP	475	FL1 (450/50)
	Hoechst 33342	483	FL1 (450/50)
	AmCyan1	491	FL2 (525/50)
	T-Sapphire	511	FL2 (525/50)
	Qdot 525	525	FL2 (525/50)
	Qdot 545	545	FL2 (525/50)
	Pacific Orange	551	FL2 (525/50)
	Brilliant Violet 570	570	FL3 (600/60)

	Qdot 585	588	FL3 (600/60)
	Qdot 605	603	FL3 (600/60)
	Qdot 655	654	FL4 (665/30)
	Qdot 705	705	FL5 (720/60)
	Qdot 800	800	FL6 (785/60)
488 nm laser	EGFP (Enhanced GFP)	508	FL1 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL1 (525/50)
	FITC	518	FL1 (525/50)
	Alexa Fluor 488	519	FL1 (525/50)
	EYFP (Enhanced YFP)	527	FL1 (525/50)
	mCitrine	529	FL1 (525/50)
	PE (R-Phycoerythrin)	576	FL2 (585/30)
	PE-Texas Red	615	FL3 (617/30)
	PI (Propidium Iodide)	617	FL3 (617/30)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)

2 lasers (488 and 561 nm lasers), optical filter pattern 1

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
488 nm laser	EGFP (Enhanced GFP)	508	FL1 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL1 (525/50)
	FITC	518	FL1 (525/50)
	Alexa Fluor 488	519	FL1 (525/50)
	EYFP (Enhanced YFP)	527	FL1 (525/50)
	mCitrine	529	FL1 (525/50)
	PE (R-Phycoerythrin)	576	FL2 (585/30)
	PE-Texas Red	615	FL3 (617/30)
	PI (Propidium Iodide)	617	FL3 (617/30)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)
561 nm laser	mOrange	562	FL2 (583/30)
	DsRed-Monomer	586	FL2 (583/30)

	tdTomato	581	FL2 (583/30)
	mCherry	610	FL3 (617/30)
	mPlum	649	FL4 (665/30)

3 lasers (405, 488, and 638 nm lasers), optical filter pattern 2

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
405 nm laser	Brilliant Violet 421	421	FL1 (450/50)
	Alexa Fluor 405	421	FL1 (450/50)
	DAPI	455	FL1 (450/50)
	Pacific Blue	455	FL1 (450/50)
	mCFP	475	FL1 (450/50)
	Hoechst 33342	483	FL1 (450/50)
	AmCyan1	491	FL2 (525/50)
	T-Sapphire	511	FL2 (525/50)
	Qdot 525	525	FL2 (525/50)
	Qdot 545	545	FL2 (525/50)
	Pacific Orange	551	FL2 (525/50)
	Brilliant Violet 570	570	FL3 (600/60)
	Qdot 585	588	FL3 (600/60)
	Qdot 605	603	FL3 (600/60)
	Qdot 655	654	FL4 (665/30)
	Qdot 705	705	FL5 (720/60)
	Qdot 800	800	FL6 (785/60)
488 nm laser	EGFP (Enhanced GFP)	508	FL2 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL2 (525/50)
	FITC	518	FL2 (525/50)
	Alexa Fluor 488	519	FL2 (525/50)
	EYFP (Enhanced YFP)	527	FL2 (525/50)
	mCitrine	529	FL2 (525/50)
	PE (R-Phycoerythrin)	576	FL3 (600/60)
	PE-Texas Red	615	FL3 (600/60)
	PI (Propidium Iodide)	617	FL3 (600/60)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)
638 nm laser	APC (Allophycocyanin)	660	FL4 (665/30)

	Cy5	670	FL4 (665/30)
	Alexa Fluor 647	668	FL4 (665/30)
	APC-Cy5.5	695	FL5 (720/60)
	Alexa Fluor 700	719	FL5 (720/60)
	APC-Cy7	779	FL6 (785/60)
	APC-Alexa Fluor 750	775	FL6 (785/60)

3 lasers (405, 488, and 561 nm lasers), optical filter pattern 2

Appendix B Miscellaneous

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
405 nm laser	Brilliant Violet 421	421	FL1 (450/50)
	Alexa Fluor 405	421	FL1 (450/50)
	DAPI	455	FL1 (450/50)
	Pacific Blue	455	FL1 (450/50)
	mCFP	475	FL1 (450/50)
	Hoechst 33342	483	FL1 (450/50)
	AmCyan1	491	FL2 (525/50)
	Brilliant Violet 510	510	FL2 (525/50)
	T-Sapphire	511	FL2 (525/50)
	Qdot 525	525	FL2 (525/50)
	Qdot 545	545	FL2 (525/50)
	Pacific Orange	551	FL2 (525/50)
	Brilliant Violet 570	570	FL3 (600/60)
	Qdot 585	588	FL3 (600/60)
	Qdot 605	603	FL3 (600/60)
	Brilliant Violet 605	605	FL3 (600/60)
	Brilliant Violet 650	650	FL4 (665/30)
	Qdot 655	654	FL4 (665/30)
	Qdot 705	705	FL5 (720/60)
	Brilliant Violet 711	711	FL5 (720/60)
	Brilliant Violet 785	785	FL6 (785/60)
	Qdot 800	800	FL6 (785/60)

488 nm laser	EGFP (Enhanced GFP)	508	FL2 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL2 (525/50)
	FITC	518	FL2 (525/50)
	Alexa Fluor 488	519	FL2 (525/50)
	SYBR Green ?	522	FL2 (525/50)
	EYFP (Enhanced YFP)	527	FL2 (525/50)
	Vinus	528	FL2 (525/50)
	mCitrine	529	FL2 (525/50)
	PE (R-Phycoerythrin)	576	FL3 (600/60)
	PE-Texas Red	615	FL3 (600/60)
	PI (Propidium Iodide)	617	FL3 (600/60)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)
561 nm laser	mOrange	562	FL3 (600/60)
	DsRed-Monomer	586	FL3 (600/60)
	tdTomato	581	FL3 (600/60)
	mCherry	610	FL3 (600/60)
	mPlum	649	FL4 (655/30)

Fluorochrome Detection Matrix

3 lasers (405, 561, and 638 nm lasers), optical filter pattern 1

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
488 nm laser	EGFP (Enhanced GFP)	508	FL1 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL1 (525/50)
	FITC	518	FL1 (525/50)
	Alexa Fluor 488	519	FL1 (525/50)
	SYBR Green ?	522	FL1 (525/50)
	EYFP (Enhanced YFP)	527	FL1 (525/50)
	Venus	528	FL1 (525/50)
	mCitrine	529	FL1 (525/50)
	PE (R-Phycoerythrin)	576	FL2 (585/30)
	PE-Texas Red	615	FL3 (617/30)
	PI (Propidium Iodide)	617	FL3 (617/30)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (655/30)
	PE-Cy5	670	FL4 (655/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (655/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)
561 nm laser	mOrange	562	FL2 (585/30)
	DsRed-Monomer	586	FL2 (585/30)
	tdTomato	581	FL2 (585/30)
	mCherry	610	FL3 (617/30)

	mPlum	649	FL4 (655/30)
638 nm laser	APC (Allophycocyanin)	660	FL4 (655/30)
	Cy5	670	FL4 (655/30)
	Alexa Fluor 647	668	FL4 (655/30)
	APC-Cy5.5	695	FL5 (720/60)
	Alexa Fluor 700	719	FL5 (720/60)
	APC-Cy7	779	FL6 (785/60)
	APC-Alexa Fluor 750	775	FL6 (785/60)

4 lasers (405, 488, 561, and 638 nm lasers), optical filter pattern 2

Appendix B Miscellaneous

Excitation laser	Fluorochrome		Channel (optical filter)
	Name	Peak emission wavelength (nm)	
405 nm laser	Brilliant Violet 421	421	FL1 (450/50)
	Alexa Fluor 405	421	FL1 (450/50)
	DAPI	455	FL1 (450/50)
	Pacific Blue	455	FL1 (450/50)
	mCFP	475	FL1 (450/50)
	Hoechst 33342	483	FL1 (450/50)
	AmCyan1	491	FL2 (525/50)
	T-Sapphire	511	FL2 (525/50)
	Qdot 525	525	FL2 (525/50)
	Qdot 545	545	FL2 (525/50)
	Pacific Orange	551	FL2 (525/50)
	Brilliant Violet 570	570	FL3 (600/60)
	Qdot 585	588	FL3 (600/60)
	Qdot 605	603	FL3 (600/60)
	Qdot 655	654	FL4 (665/30)
	Qdot 705	705	FL5 (720/60)
	Qdot 800	800	FL6 (785/60)
488 nm laser	EGFP (Enhanced GFP)	508	FL2 (525/50)
	CFSE (Carboxyfluorescein Succinimidyl ester)	517	FL2 (525/50)
	FITC	518	FL2 (525/50)
	Alexa Fluor 488	519	FL2 (525/50)

	EYFP (Enhanced YFP)	527	FL2 (525/50)
	mCitrine	529	FL2 (525/50)
	PE (R-Phycoerythrin)	576	FL3 (600/60)
	PE-Texas Red	615	FL3 (600/60)
	PI (Propidium Iodide)	617	FL3 (600/60)
	7-AAD (7-Aminoactinomycin D)	647	FL4 (665/30)
	PE-Cy5	670	FL4 (665/30)
	PerCP (Peridinin chlorophyll protein)	675	FL4 (665/30)
	PE-Cy5.5	695	FL5 (720/60)
	PerCP-Cy5.5	695	FL5 (720/60)
	PerCP-eFluor 710	710	FL5 (720/60)
	PE-Cy7	779	FL6 (785/60)
561 nm laser	mOrange	562	FL3 (600/60)
	DsRed-Monomer	586	FL3 (600/60)
	tdTomato	581	FL3 (600/60)
	mCherry	610	FL3 (600/60)
	mPlum	649	FL4 (665/30)
638 nm laser	APC (Allophycocyanin)	660	FL4 (665/30)
	Cy5	666	FL4 (665/30)
	Alexa Fluor 647	668	FL4 (665/30)
	APC-Cy5.5	695	FL5 (720/60)
	Alexa Fluor 700	719	FL5 (720/60)
	APC-Cy7	779	FL6 (785/60)
	APC-Alexa Fluor 750	775	FL6 (785/60)

Relationship between Sample Pressure and Sample Flow/Event Rate

100 µm sorting chip

[Sample Pressure]		1	2	3	4	5	6	7	8	9	10
Flow rate (µl/min)		6	11	16	21	27	37	47	58	68	89
Event rate (eps)	Sample concentration (1e6/ml)	60	160	260	350	450	650	840	1,000	1,200	1,600
	Sample concentration (1e7/ml)	600	1,300	2,100	2,800	3,600	5,100	6,600	8,100	9,600	12,600

130 µm sorting chip

[Sample Pressure]		1	2	3	4	5	6	7	8	9	10
Flow rate (µl/min)		1	3	7	10	16	22	28	34	40	50
Event rate (eps)	Sample concentration (1e6/ml)	10	30	100	150	250	400	500	600	700	900
	Sample concentration (1e7/ml)	100	600	1,200	2,000	2,800	3,600	4,500	5,400	6,500	8,000