

# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### Analyzers

#### Aurora A & B (5 lasers)

Spectral Analyzers

Cytek Biosciences



Aurora A is located in ARC 1207i

Aurora B is located in CTRB 10107

The **Aurora analyzers** (Cytek Biosciences) are spectral cytometers equipped with 5 lasers (355, 405, 488, 561, and 640 nm), 64 fluorescence channels, and 3 light scatter detectors (FSC, SSC blue and SSC violet).

- Two side scatter detectors off the blue and violet lasers.
- **Aurora A** can be set to automatically load samples from 96 well plates
- Sample flow rates: Low: 15  $\mu\text{L}/\text{min}$ , Medium: 30  $\mu\text{L}/\text{min}$ , High: 60  $\mu\text{L}/\text{min}$ , Plate high-throughput mode: 100  $\mu\text{L}/\text{min}$
- Theoretical limit of fluorochromes detectable: 62 different fluorochromes per sample
- **Software: SpectroFlo 3**
- Capability of performing autofluorescence extraction (cellular autofluorescence is handled as a distinct spectral signature).

Laser	Ex(nm)	Em (nm Channel)	Fluorochromes
UV	355	373/15 UV1	
	355	388/15 UV2	BUV395, CellTrace Blue
	355	428/15 UV3	
	355	443/15 UV4	
	355	458/15 UV5	
	355	473/15 UV6	LD Blue, AF350, CellTrace Calcein Blue, DyLight350, eFluor455
	355	514/28 UV7	BUV496, DAPI, Hoechst 33342, Zombie UV
	355	542/28 UV8	
	355	582/31 UV9	BUV563
	355	613/31 UV10	BUV615
	355	664/27 UV11	BUV661
	355	692/28 UV12	
	355	720/29 UV13	
	355	750/30 UV14	BUV737
	355	780/30 UV15	
	355	812/34 UV16	BUV805
Violet	405	428/15 V1	BV421
	405	443/15 V2	AF405, SB436, Zombie Violet, cFluor V420, DyLight405
	405	458/15 V3	BFP, CellTrace Violet, cFluorV450, LD Violet, PacBlue, VioBlue
	405	473/15 V4	SYTOX Blue
	405	508/20 V5	BV480, AmCyan, CFP, cFluorV505, mCerulean3, VioletFluor500
	405	525/17 V6	Sapphire
	405	542/17 V7	BV510, LD Aqua, Krome Orange, eFluor506, Ghost Dye Violet 510
	405	581/19 V8	BV570, LD Yellow, PacOrange, Spark Violet 538, cFluorV547
	405	598/20 V9	
	405	615/20 V10	BV605, SB600, Zombie Yellow, cFluorV610, ViaDye Violet
	405	664/27 V11	BV650, SB645
	405	692/28 V12	
	405	720/29 V13	BV711, SB702
	405	750/30 V14	BV750
	405	780/30 V15	BV785, BV786, SB780
	405	812/34 V16	

\*BV = Brilliant Violet; SB = Super Bright; AF = Alexa Fluor; L/D = Live/Dead.

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## Instrument Optical Configuration

(continued)

Aurora A & B (5 lasers)		Spectral Analyzers		Cytek Biosciences
Laser	Ex(nm)	Em (nm)	Channel	Fluorochromes
Blue	488	508/20	B1	BB515, CellTrace Calcein Green, NovaFluor Blue 510, VioB515
	488	525/17	B2	FITC, GFP, AF488, CFSE, CellTracker Green, Kiravia Blue 520
	488	542/17	B3	LD Green, MitoTracker Green, SYTOX Green, Spark Blue 550, YFP, RB545, AF532
	488	581/19	B4	
	488	598/20	B5	NovaFluor Blue 585
	488	615/20	B6	BB630 MitoSOX Red, NovaFluor Blue 610, NovaFluor Blue 610-70S
	488	661/17	B7	BB660, NovaFluor Blue 660-120S
	488	679/18	B8	PerCP, cFluor B675
	488	697/19	B9	PerCP-Cy5.5, BB700, cFluor B690, RB705
	488	717/20	B10	PerCP-eFluor 710, PerCP-Vio 700
	488	738/21	B11	
	488	760/23	B12	BB755
	488	783/23	B13	
	488	812/34	B14	BB790, RB780
Yellow-green	561	577/20	YG1	PE, AF546, AF555, AF561, CellTrace Yellow, Cy3, tdTomato, DsRed, RY586
	561	598/20	YG2	Spark YG 593, CF583, mApple, NovaFluor Yellow 590
	561	615/20	YG3	PE-CF594, PE-Dazzle, PE-TxRed, LD Red, mCherry, PE-vio 615
	561	661/17	YG4	7-Aad, PE-Fire 640, PI, PE-AF 610, NovaFluor Yellow 660, mKate
	561	679/18	YG5	PE-Cy5, cFluor BYG667
	561	697/19	YG6	NovaFluor Yellow 690
	561	720/29	YG7	PE-Cy5.5, PE-Fire 700, PE-AF 700, NovaFluor Yellow 730
	561	750/30	YG8	cFluor BYG750
	561	780/30	YG9	PE-Cy7, PE-Vio 770, cFluor BYG781
	561	812/34	YG10	PE-Fire 810
Red	640	661/17	R1	APC, CellTrace Far Red, cFluor R659, CF633, ViaKrome 638
	640	679/18	R2	AF647, LD Far Red, eFluor660, Vio667, NovaFluor Red 660
	640	697/19	R3	AF660, APC-Cy5.5, DRAQ5, DRAQ7, Spark NIR 685
	640	717/20	R4	AF700, AF680, APC-AF700, Ghost Dye Red 710, R718
	640	738/21	R5	ViaKrome 808
	640	760/23	R6	Zombie NIR
	640	783/23	R7	APC-Cy7, APC-Fire 780, APC-Fire 750, eFluor 780, LD NIR
	640	812/34	R8	AF790, APC-Fire 810, cFluor R840, DyLight 800

\*BV = Brilliant Violet; SB = Super Bright; AF = Alexa Fluor; L/D = Live/Dead.

Note: The optical configuration for the Aurora analyzers (shown above) also applies to **Aurora CS (Cell Sorter)**.

# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### CytoFLEX LX (6 lasers)

#### Analyzer

Beckman-Coulter



ARC 1207

Laser	Ex (nm)	Em (nm)	Channel	Fluorochromes
Near UV	375	405/30	NUV405	BUV395
Near UV	375	450/50	NUV450	DAPI, Hoechst blue, L/D blue, Zombie UV
Near UV	375	675/30	NUV675	BUV661, Hoechst red
Violet	405	450/45	V450	Pacific Blue, BV421, Horizon V450, eFluor 450, SB436
Violet	405	525/40	V525	L/D Aqua, BV510, AmCyan, Qdot 525, V500
Violet	405	610/20	V610	BV605, SB600, Qdot 605
Violet	405	660/20	V660	BV650, SB645, Qdot 655
Violet	405	763/42	V763	BV786, SB780
Blue	488	525/40	B525	FITC, AF488, GFP, CFSE, Fluo-4
Blue	488	610/20	B610	MitoSOX red, PE-CF594, PE-Texas Red, PI
Blue	488	690/50	B690	PerCP, PerCP-Cy5.5
Yellow-Green	561	585/42	Y585	PE, dTomato, RFP, dsRed, mOrange
Yellow-Green	561	610/20	Y610	mCherry, PE-CF594, PE-Texas Red, PI
Yellow-Green	561	675/30	Y675	PE-Cy5, 7AAD, mPlum, PE-AF647, PC5
Yellow-Green	561	710/50	Y710	PE-Cy5.5, PE-AF680, PC5.5
Yellow-Green	561	763/42	Y763	PE-Cy7, PC7
Red	638	660/10	R660	APC, AF647, DRAQ5
Red	638	712/25	R712	AF700, APC-R700
Red	638	763/42	R763	APC-Cy7, APC-H7, APC-Fire750, DRAQ7
Infrared	808	840/20	IR840	AF790, IRDye 800CW
Infrared	808	885/40	IR885	PromoFluor-840

### CytoFLEX S (4 lasers)

#### Analyzer

Beckman-Coulter



ARC 1207


Laser	Ex (nm)	Em (nm)	Channel	Fluorochromes
Violet	405	450/45	V450	Pacific Blue, BV421, Horizon V450, eFluor 450, SB436
Violet	405	525/40	V525	L/D Aqua, BV510, AmCyan, Qdot 525, V500
Violet	405	610/20	V610	BV605, SB600, Qdot 605
Violet	405	660/20	V660	BV650, SB645, Qdot 655
Blue	488	525/40	B525	FITC, AF488, GFP, CFSE, Fluo-4
Blue	488	690/50	B690	PerCP, PerCP-Cy5.5
Yellow-Green	561	585/42	Y585	PE, dTomato, RFP, dsRed, mOrange
Yellow-Green	561	610/20	Y610	mCherry, PE-CF594, PE-Texas Red, PI
Yellow-Green	561	690/50	Y690	PE-Cy5.5, PE-AF680, PC5.5
Yellow-Green	561	763/42	Y763	PE-Cy7, PC7
Red	638	660/10	R660	APC, AF647, DRAQ5
Red	638	712/25	R712	AF700, APC-R700
Red	638	763/42	R763	APC-Cy7, APC-H7, APC-Fire750, APC-eFluor 780, DRAQ7

\*BV = Brilliant Violet; SB = Super Bright; AF = Alexa Fluor; L/D = Live/Dead.

# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### Analyzers

CytoFLEX S (3 lasers)	Analyzer				Beckman-Coulter
	Laser	Ex (nm)	Em (nm)	Channel	Fluorochromes
 <p>ARC1207</p>	Violet	405	450/45	V450	Pacific Blue, BV421, Horizon V450, eFluor 450, SB436
	Violet	405	525/40	V525	L/D Aqua, BV510, AmCyan, Qdot 525, V500
	Violet	405	610/20	V610	BV605, SB600, Qdot 605
	Violet	405	660/20	V660	BV650, SB645, Qdot 655
	Violet	405	763/42	V610	BV785
	Blue	488	525/40	B525	FITC, AF488, GFP, CFSE, Fluo-4
	Blue	488	585/42	B585	PE
	Blue	488	610/20	B610	PE-CF594, PE-Texas Red, PI
	Blue	488	690/50	B690	PerCP, PerCP-Cy5.5
	Blue	488	763/42	B763	PE-Cy7, PC7
	Red	638	660/10	R660	APC, AF647, DRAQ5
	Red	638	712/25	R712	AF700, APC-R700
	Red	638	763/42	R763	APC-Cy7, APC-H7, APC-Fire750, APC-eFluor 780, DRAQ7

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# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### Analyzers

#### LSR Fortessa



ARC 1207

LSR Fortessa		Analyzer			BD Biosciences
Laser	Ex (nm)	Em (nm)	Channel	Fluorochromes	
Ultra-violet	355	379/28	355-B	BUV395	
Ultra-violet	355	450/50	355-A	DAPI, L/D blue, Zombie UV, Hoechst 33342	
Violet	405	450/50	405-F	Pacific Blue, BV421, eFluor450, SB436	
Violet	405	525/50	405-E	L/D Aqua, BV510, AmCyan	
Violet	405	610/20	405-D	BV605, SB600	
Violet	405	655/8	405-C	BV650, SB645	
Violet	405	710/50	405-B	BV711, SB702	
Violet	405	780/60	405-A	BV786, SB780	
Blue	488	530/30	488-B	FITC, AF488, GFP, CFSE, Fluo-4	
Blue	488	695/40	488-A	PerCP, PerCP-Cy5.5, PerCP-eFluor710	
Yellow-Green	561	582/15	561-E	PE, dTomato, RFP	
Yellow-Green	561	610/20	561-D	PE-Texas Red, PI, mCherry, PE-CF594	
Yellow-Green	561	660/20	561-C	PE-Cy5, 7AAD, mPlum, PE-AF647	
Yellow-Green	561	710/50	561-B	PE-Cy5.5	
Yellow-Green	561	780/60	561-A	PE-Cy7	
Red	640	670/14	561-C	APC, AF647, DRAQ5	
Red	640	710/50	561-B	AF700	
Red	640	780/60	561-A	APC-Cy7, APC-H7, APC-Fire750, APC-eFluor 780, DRAQ7	

#### LSR II



CTRB 10107

LSR II		Analyzer			BD Biosciences
Laser	Ex (nm)	Em (nm)	Channel	Fluorochromes	
Ultra-violet	355	379/28	355-B	BUV395	
Ultra-violet	355	450/50	355-A	DAPI, L/D blue, Zombie UV, Hoechst 33342	
Violet	405	450/50	405-F	Pacific Blue, BV421, Horizon V450, eFluor450	
Violet	405	525/50	405-E	L/D Aqua, BV510, AmCyan	
Violet	405	610/20	405-D	BV605, SB600	
Violet	405	660/20	405-C	BV650, SB645	
Violet	405	710/50	405-B	BV711, SB702	
Violet	405	780/60	405-A	BV786, SB780	
Blue	488	530/30	488-D	FITC, AF488, GFP, CFSE, Fluo-4	
Blue	488	575/26	488-C	PE, dTomato, RFP, PI	
Blue	488	695/40	488-B	PerCP, PerCP-Cy5.5, PerCP-eFluor710, 7AAD	
Blue	488	780/60	488-A	PE-Cy7	
Red	633	660/20	488-C	APC, AF647, DRAQ5	
Red	633	720/40	633-B	AF700	
Red	633	780/60	633-A	APC-Cy7, APC-H7, APC-Fire750, APC-eFluor 780, DRAQ7	

\*BV = Brilliant Violet; SB = Super Bright; AF = Alexa Fluor; L/D = Live/Dead.

# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### Imaging system

Evos FL Auto		Imaging system		ThermoFisher
Light cubes:	Ex (nm)	Em (nm)	Fluorochromes	
DAPI	357/44	447/60	DAPI, Hoechst	
GFP	470/22	510/42	GFP, AF488	
YFP	500/24	524/27	YFP	
RFP	531/40	593/40	RFP, AF546, DsRed, Cy3	
Texas Red	585/29	624/40	Texas Red, AF568, AF594, MitoTracker Red, mCherry, Cy3.5	
Cy5	628/40	692/40	AF647, AF660, DRAQ5, Cy5	



ARC 1207

Evos FL Auto is a fully-automated, inverted, multi-channel fluorescence / transmitted light imaging system.

- Long working distance objectives: 1.25x, 4x, 10x, 20x, 40x
- Color camera for bright field and phase imaging.
- Monochrome camera for fluorescence detection.
- Motorized 3D stage.
- Built-in software for counting cells, scanning slides or plates, time-lapse imaging, Z stacks.
- All light cubes may be swapped between Evos and the Countess.

### Cell counter

Countess II FL		Cell counter		ThermoFisher
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ARC 1207

- Automatic hemocytometer based on bright field and fluorescence imaging.
- Count live / dead cells and measure average cell size in as little as 10 seconds.
- Reusable slide available in the flow lab.
- Compatible single-use slides: Invitrogen cat.# C10228; BioRad cat.# 1450011
- Up to two light cubes can be installed on the Countess for fluorescence detection.

### Sorter for large particles

Biosorter		Sorter for large particles		Union Biometrica
Laser	Ex (nm)	Em (nm)	Fluorochromes	



ARC 1207 H

Blue	488	510/23	GFP, FITC, AF488, CFSE, Fluo-4	
Blue	488	543/22	YFP	
Yellow-Green	561	615/24	dsRed, mCherry, PI	

The Biosorter is designed for sorting large particles (40 - 700  $\mu\text{m}$ ): cell clusters, *C. elegans*, zebrafish etc. It cannot be used for cells with diameters < 40  $\mu\text{m}$  because they are below the detection limit of this device. The sorting speed on this instrument is very low (20 events/second).

This device is not encased in a biosafety cabinet.

# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### Sorters

#### Aurora CS

Cell sorter

BD Biosciences



ARC 1207i

**Aurora CS** is a spectral **cell sorter** with 5 lasers (355, 405, 488, 561, nd 640 nm), 64 fluorescence channels and 3 light scatter detectors (FSC, SSC blue and SSC violet).

- Very complex and also very simple panels (e.g. GFP) sorts can be performed.
- Two nozzle sizes are available (70 and 100 µm).
- Four-way sorting can be done in FACS tubes; six-way sorting only in Eppendorf tubes; two-way sorting in 15 mL conical tubes.
- The optical configuration for the Aurora analyzer (see pages 1 & 2) also applies to Aurora .

#### FACSJazz

Cell sorter

BD Biosciences



ARC 1207 A/B

Laser	Ex (nm)	Em (nm)	Fluorochromes
Blue	488	530/40	FITC, AF488, GFP, YFP
Blue	488	670LP	PerCP-Cy5.5, 7AAD, PE-Cy7
Yellow-Green	561	585/29	PE, dTomato, DsRed, RFP, Cy3
Yellow-Green	561	610/20	mCherry, PE-CF594, PE-Texas Red, PI
Red	640	660/20	APC, AF647, DRAQ5, Cy5
Red	640	750LP	APC-Cy7, APC-H7, APC Fire750, DRAQ7

#### FACSAria Fusion

Cell sorter

BD Biosciences



ARC 1207H

Laser	Ex (nm)	Em (nm)	Fluorochromes
Violet	405	450/50	Pacific Blue, BV421, Horizon V450, eFluor450, BFP
Violet	405	525/50	L/D Aqua, BV510, AmCyan, Qdot 525
Violet	405	610/20	BV605, SB600
Violet	405	660/20	BV650, SB645
Violet	405	710/50	BV711, Qdot 705
Violet	405	780/60	BV786
Blue	488	530/30	FITC, AF488, GFP, CFSE, Fluo-4
Blue	488	695/40	PerCP, PerCP-Cy5.5
Yellow-Green	561	582/15	PE, dTomato, mOrange, RFP
Yellow-Green	561	610/20	PE-Texas Red, PI, mCherry, PE-CF594
Yellow-Green	561	670/14	PE-Cy5, 7AAD
Yellow-Green	561	780/60	PE-Cy7
Red	640	670/30	APC, AF647, DRAQ5, Cy5
Red	640	730/45	AF700
Red	640	780/60	APC-Cy7, APC-H7, APC Fire750, DRAQ7

# FLOW CYTOMETRY CORE

## Instrument Optical Configuration

### FACSAria II

Cell sorter

BD Biosciences



ARC 1207H

Laser	Ex (nm)	Em (nm)	Fluorochromes
Blue	488	530/30	FITC, Alexa Fluor 488, GFP, CFSE, Fluor-4
Blue	488	675/20	PerCP, PerCP-Cy5.5
Yellow-Green	561	585/15	PE, dTomato, mOrange
Yellow-Green	561	610/20	mCherry, PE-CF594, PE-Texas Red, PI
Yellow-Green	561	710/40	PE-Cy5, 7AAD, PE-AF647, mPlum
Yellow-Green	561	780/60	PE-Cy7
Red	640	675/20	APC, Alexa Fluor 647, DRAQ5
Red	640	780/60	APC-Cy7, APC-H7, APC-Fire750, DRAQ7

\*FACSAria II is not enclosed in a biosafety cabinet and may only be used with samples that require biosafety level 1 containment

### FACSMelody

Cell sorter

BD Biosciences



ARC 1104C

Laser	Ex (nm)	Em (nm)	Fluorochromes
Violet	405	448/45	Pacific Blue, BV421, Cascade Blue, BFP
Violet	405	528/45	L/D Aqua, BV510, AmCyan, CFP
Violet	405	755LP	BV785
Blue	488	527/32	FITC, GFP, YFP, Alexa Fluor 488, CFSE
Blue	488	586/42	PE, PI
Blue	488	700/54	PerCP, PerCP-Cy5.5, 7AAD
Blue	488	783/56	PE-Cy7
Red	640	660/10	APC, AF647, DRAQ5, Cy5
Red	640	783/56	APC-Cy7, APC-H7, APC-Fire750, DRAQ7

\*BV = Brilliant Violet; SB = Super Bright; AF = Alexa Fluor; L/D = Live/Dead.

### Data analysis workstation



ARC 1207i

A Data Analysis Workstation is available for an hourly fee.

The following software packages are installed:

- FlowJo
- FCS Express
- CytExpert
- SpectroFlo

### Check our iLab website for additional information

[https://my.ilabsolutions.com/service\\_center/show\\_external?id=4691](https://my.ilabsolutions.com/service_center/show_external?id=4691)

