A prodigy incorporating a unique combination of patent-pending innovative technologies that takes flow cytometry to the next level of performance and flexibility.

With up to four lasers, three scattering channels, and 48 fluorescence channels, the Aurora suits every laboratory’s needs, from simple to high-complexity applications. A paradigm shifting optical design provides unprecedented flexibility, enabling the use of a wide array of new fluorochrome combinations without reconfiguring your system for each application. The state-of-the-art optics and low-noise electronics provide excellent sensitivity and resolution. Flat-top laser beam profiles, combined with a uniquely designed fluidics system, translate to outstanding performance at high sample flow rates.

The end result is a system that delivers high quality data where rare and dim populations are easily resolved, regardless of assay complexity.

SpectroFlo® software offers an intuitive workflow from QC to data analysis with technology-enabling tools that simplify running any application.

The Cytek team has reimagined every aspect of cytometry hardware and software to deliver an instrument that fulfills every scientist’s needs.

Meet Aurora:

Aurora's Revolutionary Technologies:
From Vision to Reality

The Aurora is capable of up to 51 detection channels (48 fluorescent channels, FSC, blue laser SSC, and violet laser SSC) and is empowered by revolutionary technologies, including:

- Proprietary high sensitivity Coarse Wavelength Division Multiplexing (CWDM) semiconductor detector arrays, enabling more efficient spectrum capture for dyes emitting in the 420-830 nm range.
- High bandwidth electronics design scalable beyond 51 channels.
- Robust vacuum fluidics system enables ultimate flexibility in sample input formats.
- Exceptional small particle detection is enabled by violet laser scatter, narrow beam height, and proprietary flat top laser design.

Maximum Channels
51 channels of detection over the full emission spectra.

Maximum Colors
Up to 24 colors demonstrated including fluorochnomes with emission spectra in close proximity to each other.

Maximum Sensitivity
Sensitivity redefined using state-of-the-art optics and low-noise electronics.

Maximum Flexibility
No changing optical filters for any fluorochrome.
Use any commercially available fluorochrome excited by the onboard lasers.

Maximum Accessibility
A powerful, high value system that is accessible to a wide range of users.
Application Flexibility For More Users

Aurora’s revolutionary technologies offer many capabilities and features. With its onboard 100mW 405nm laser and highly sensitive violet side scatter detector, particles nearing 100nm in size can be analyzed. Aurora opens the door to a wide variety of small particle applications. For those challenging applications involving highly autofluorescent particles, let the software’s autofluorescence extraction tool bring new levels of resolution.

Small Particle Detection Example: ApogeeMix

Resolution of ApogeeMix (Apogee Flow Systems), mixture of beads ranging from 130nm to 110nm, when acquired on the Aurora. The smallest particles can be easily identified above background.

Data analyzed using FCS Express 6 by De Novo™ Software.

Autofluorescence Extraction Example: PrimeFlow™ RNA Assay

Human U937 cells were subjected to the PrimeFlow™ RNA Assay, underwent a series of hybridization steps to label mRNA for HMBS, a low expressed gene (~10 copies/cell), and analyzed using SpectroFlo® software with two different strategies, one with autofluorescence extraction and one without.

The 24-Color Panel Includes Many Highly Overlapping Dyes:

Violet Excited Dyes Emission Spectra

Blue Excited Dyes Emission Spectra

Red Excited Dyes Emission Spectra

SPECTRUM OF AXL

APC-Cy7: US Patent Number 5,714,386.


Allophycocyanin (APC) conjugates: US Patent No. 5,714,386

Cytek ® Aurora
Say Hello to a New Reality

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A New Reality:
3 Lasers, 24 Colors, Unparalleled Resolution

Granulocytes
Monocytes
Lineage Negative Cells
B Cells
NK Cells
NK T Cells
Double Negative Cells
Treg Cells
CD8+ Effector Memory Cells
CD4+ Effector Memory Cells
Fluorescent Proteins and Challenging Dye Combinations

The detection of some fluorescent protein or fluorochrome combinations by conventional flow cytometry presents a challenge due to high amounts of spectral overlap (Figure 1, 4). The Aurora addresses this challenge by using differences in full emission spectra signatures across all lasers to clearly resolve these combinations, even if the populations are co-expressed (Figures 2, 3, 5, and 6).

**Example 1: APC and Alexa Fluor 647**

Figure 1: Spectrum plots from a conventional spectrum viewer show heavy overlap between APC and Alexa Fluor 647.

Figure 2: Spectrum plots from a four laser Aurora show distinct signatures for APC and Alexa Fluor 647.

**Example 2: BFP, GFP, and mCherry**

Figure 3: Whole blood from a healthy donor was stained, lysed, washed, and analysed on a four laser Aurora system. Subsets of NK and NK T cells that co-express CD56 Alexa Fluor 647 and CD8 APC were easily identified. For comparison, blood from the same donor was stained with CD56 PE and CD8 APC and yielded similar percentages of NK and NK T cells, demonstrating that APC and Alexa Fluor 647 combined did not impact results.

Figure 4: Spectrum plots from a conventional spectrum viewer.

Figure 5: Spectrum plots from a four laser Aurora show distinct signatures for BFP, GFP, and mCherry.

Figure 6: A20.2 mouse lymphoma Stem Cells were genetically modified to stably express BFP, GFP and mCherry under the control of different fate marker promoters. The stable cell line generated was then cultured under differentiation conditions, harvested, and analysed on a four laser Aurora system to assess the expression of fluorescent proteins. Autofluorescence extraction was used to enhance results. Sample courtesy from Luigi Russo, Hannah L. Sladitschek and Pierre Neveu, Cell Biology & Biophysics, Neveu group, EMBL.

**Get to Know Our Automatic Micro-Sampling System (AMS)**

The new AMS offers preset and user adjustable settings that allows the loader to be fine tuned to your experimental requirements. The AMS is specifically designed to streamline experimental workflow and seamlessly integrates into the Aurora. The AMS also offers ease of use, low carry over, and minimal dead volume.

- **Quick and easy**
  - Reliable 96 well plate acquisition maximizes productivity.
  - Easily change between plates and tubes in a matter of seconds.

- **Three throughput modes**
  - Optimized acquisition speeds, from low carry over to high throughput.

- **User customizable modes**
  - Fully customizable with a suite of user modes to fit a variety of applications and workflows.
**SpectroFlo® Software Guided Workflows**

The new SpectroFlo software offers an intuitive workflow from QC to data analysis with technology-enabling tools that simplify running any application.

**QC and Setup:**
Run Daily QC to monitor instrument performance and add reference controls.

**Library:**
Add or remove experiment templates, worksheet templates, fluorochrome information, QC bead information, and more.

**Acquisition:**
From the Acquisition menu, you can start a new experiment and get to your data in three simple guided steps.

**Experiment Workflow:**
From the Acquisition menu, you can start a new experiment and get to your data in three simple guided steps.

1. **Step 1: Create Your Experiment**
Create your experiment, choose fluorochromes, and add labels, tubes, worksheets, and stopping criteria in this guided workflow.

2. **Step 2: Acquire Your Tubes**
Load and acquire your samples.

3. **Step 3: Unmix Your Data**
Visualize your reference controls spectra using our unique unmixing wizard.

**Specifications**

**Optics**

**EXCITATION OPTICS**

**OPTICAL PLATFORM**

Aurora contains a fixed optical assembly with the capacity to be configured with up to five spatially separated laser beams. Laser delays are automatically adjusted during instrument QC.

**LAGERS**

Three laser configuration: 405nm: 100mW, 488nm: 50mW, 640nm: 80mW.

Four laser configuration: 405nm: 100mW, 488nm: 50mW, 640nm: 80mW.

**BEAM GEOMETRY**

Flat-top laser beam profile with narrow vertical beam height optimized for small particle detection.

**EMISSION OPTICS**

**EMISSION COLLECTION**

Fused silica cuvette coupled to high NA lens for optimum collection efficiency to optical fibers.

**FORWARD AND SIDE SCATTER DETECTION**

FSC: High performance semiconductor detector with 488nm bandpass filter.

SSC: Two high-performance semiconductor detectors with 405nm and 488nm bandpass filters.

**FLUORESCENCE DETECTORS**

Proprietary high sensitivity Coarse Wavelength Division Multiplexing (CWDM) semiconductor array per laser enabling more efficient spectrum capture in the 420-830nm range. No filter changes required for any fluorochrome excited by the 405nm, 488nm, 561nm, and 640nm lasers.

**STANDARD OPTICAL CONFIGURATION**

- Violet detector module: 16 channels uneven spaced bandwidth from 420nm-830nm.
- Blue detector module: 14 channels uneven spaced bandwidth from 500-830nm.
- Red detector module: 8 channels uneven spaced bandwidth from 560-830nm.
- Yellow-Green detector module (in four laser systems only): 10 channels uneven spaced bandwidth from 570-830nm.

**Fluidics**

**SAMPLE FLOW RATES**

Low: 15 µL/min; Medium: 30 µL/min; High: 60 µL/min.

**FLUIDIC MODES**

Long clean, SIF flush, Purge filter, Clean flow cell.

**MANUAL SAMPLE INPUT FORMATS**

12x75mm polystyrene and polypropylene tubes.

**STANDARD FLUIDIC RESERVOIRS**

4L fluid container set with level-sensing provided. Compatible with 20L, 30L and sheath tubes.

**VOLUMETRIC SENSOR**

Volumetric measurement during sample recording enables calculation of counts per µL for any gated population.

**PLATE LOADER OPTION**

96-well microplate platform capability.

**PLATE LOADER CARRYOVER**

Default mode: ≤ 0.3%, Low Carryover mode: ≤ 0.1%, High Throughput mode: ≤ 0.1%.

**Performance**

**FLUORESCENCE SENSITIVITY**

FITC: ≤ 190 MEFL, PE: ≤ 35 MEFL, APC: ≤ 15 MEFL, Pacific Blue: ≤ 2000MEFL.

*Measurements based on an average from three systems and performed using Sphero Rainbow Calibration Plate (RCP-30-S) based on its peak emission channel.

**FLUORESCENCE LINEARITY**

FIRE: r² ≥ 0.995 / PE: r² ≥ 0.995.

**FORWARD AND SIDE SCATTER RESOLUTION**

Performance optimized for resolving lymphocytes, monocytes, and granulocytes.

**SIDE SCATTER RESOLUTION**

Capable of resolving 0.2µm beads from noise.

**CARRYOVER**

≤ 0.1%

**DATA ACQUISITION RATE**

35,000 events/s.

**SPECTROFLO® SOFTWARE**

Live unmixing during acquisition. Developed specifically to streamline assay setup, data acquisition, and file export. Automated QC module. Autofluorescence extraction. Raw and Unmixed FCS 3.1 files.

**Hardware Requirements**

**Software**

**WORKSTATION**

Intel® Core™ i7 processor, 3.6 GHz

**HARD DRIVE**

32GB SSD

**RAM**

16GB DDR4 2400Mhz

**VIDEO PROCESSOR**

NVIDIA® Quadro

**POWER**

500W with all solid-state lasers

**HEAT DISSIPATION**

600W with 3 lasers (3 lasers: 40 kW)

**AIR FILTERING**

No excessive dust or smoke

**HUMIDITY**

80%-85% relative non-condensing

**TEMPERATURE**

17–28°C

**LIGHTING**

No special requirements

**Regulatory Status**

For Research Use Only. Not for use in diagnostic or therapeutic procedures.
Cytek Biosciences is dedicated to enhancing our customers' user experience. The Aurora system is backed by our world-class service and support team that can provide phone or field based assistance. Various levels of maintenance options are available to meet your needs now, and in the future.

For more information, email us at: sales@cytekbio.com or call 1-877-922-9835

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