# **Flow Cytometry Core Facility**

The Flow Cytometry Core Facility of Albert Einstein College of Medicine is a Cancer Center subsidized shared resource. Its function is to provide access to advanced flow cytometry and cell sorting instrumentation to all investigators at the college in a user-oriented environment and cost effective manner. The facility supports and maintains a wide array of equipment, and has a dedicated staff of four technical staff providing services and training. Analysis and sorting services and instrumentation are provided in facilities that allow management of potential biohazards, enabling sorting and analysis of many types of human and animal derived samples.

Services provided include:

1. Educational seminars on principles and applications of flow cytometry analysis and cell sorting
2. Hands-on training in use of all analytic flow cytometers and FACSAria cell sorters
3. Consultation on experimental design and data interpretation
4. Cell or subcellular particle high speed sorting based on fluorescence, size and granularity (Biosafety level up to BSL-2 with enhance aerosol containment)
5. Direct assistance with data acquisition and data analysis, including full service custom analyses performed by facility staff
6. Data storage and archiving
7. iLab online booking and billing system

Instrumentation:

1. Thermo Fisher Bigfoot Spectrum Cell sorter with 7 laser and 60 detectors, 6 way cell sorting and 4 way sort into 96 and 3854 well plates. Bigfoot allows spectral unmixing or conventional compensation for high-parameter, high-throughput cell sorting experiments for maximum flexibility.
2. Two Beckman Coulter MoFlo cell sorters (MoFlo XDP and Astrios) providing up to 5 laser excitation and 15-color fluorescent detection. Includes 4-way sorting, plate sorting, aerosol containment, single cell cloning option and sample station/sort receptacle temperature control. (Operation by facility staff only).
3. Two Becton Dickinson FACSAria high-speed cell sorters providing up to 5 laser excitation and 14-color fluorescent detection. Includes optional 4-way sorting, index sorting, aerosol containment, cloning option and sample station/sort receptacle temperature control. They are available as a service operated by facility staff, or for self-operation by appropriately trained investigators.
4. Two Cytek Aurora Full Spectrum Analyzers, with 5 lasers, 64 detectors and auto loader that temperature adjustable. The Aurora system delivers high-resolution data at the single-cell level to resolve the most challenging cell populations, such as cells with high autofluorescence or low levels of expression of key biomarkers, regardless of assay complexity.
5. Two Beckman Dickson LSRII Flow Cytometers. Each is configured with 5 lasers (355nm, 405 nm, 488 nm, 561 nm and 640 nm), and capable of analyzing up to 14-colors simultaneously. They are available for independent operation and assisted use.
6. Becton Dickinson FACS Canto II analyzer: It is a 2-laser, 6-color system with multiple innovative features including a high throughput sampler (HTS) option that enables fully automated and rapid sample acquisition from 96- or 384-well microtiter plates. It is available for self operation and assisted analysis.
7. Thorlab iCys Laser Scanning Cytometer (LSC) (formerly Compucyte iCys LSC). This instrument combines the advantages of flow and image cytometry into a single system. It provides exceptionally flexibility and power for studies that combine cytometric data with cell imaging. It is equipped with three lasers (405 nm, 488 nm and 633 nm) and detects up to four simultaneous fluorescent parameters. It is available for self operation and assisted analysis.
8. Two fluorescent microscopes for standard image analysis.
9. Five computer workstations (three iMac and two PC) equipped data analysis software including FlowJo, FCS Express, Modfit and iCys programs.

Applications:

* High speed cell sorting, including single cell sorting for RNAseq
* Cell surface immunophenotyping
* Analysis of apoptosis and other cell death pathways
* Cell cycle analysis
* DNA damage and repair studies
* Fluorescent reporter and cellular translocation assays
* Calcium signaling analysis
* Single cell cytokine analysis
* Cytokine measurement by cytometric bead array (CBA), including high throughput sampler