

The **MSU South Campus Flow Cytometry Core** is located on the second floor of the IQ Bioengineering Building (Rm 2521 and 2522). Laboratory space for the core facility is approximately 300 sq. ft. Instrumentation available include a BD FACSAria IIu cell sorter, a Cytek Aurora spectral cytometer, a BD Accuri C6, and a Luminex 200. The South Campus Flow Cytometry Core is managed by Dr. Matthew Bernard who provides professional oversight, maintenance, instrument and data analysis training, access to data analysis software, and assay development expertise, as well as technical support and general education in flow cytometry principles.

**Cytek Aurora:** The Cytek Aurora is a cutting-edge spectral flow cytometer equipped with 4 lasers (violet 405nm, blue 488nm, yellow-green 561nm, and red 640nm) and has the capability of detecting up to 48 fluorescence channels with additional light scatter detectors off of the violet laser (SSC) and blue laser (FSC). The optics and state-of-the-art low-noise electronics provide excellent sensitivity and resolution. It is currently equipped with a 96-well auto-sampler and a future upgrade will include a UV laser. The Cytek Aurora is located in the MSU South Campus Flow Cytometry Core (Room 2521, IQ Building).

**BD Accuri C6:** The BD Accuri C6 is a compact flow cytometer that uses a low-pressure peristaltic pumping system to drive instrument fluidics allowing for the derivation of sample volume and calculation of absolute counts or sample concentration per microliter. The instrument is capable of running up to 10,000 events per second at sample concentrations of over  $5 \times 10^6$  cells/mL. It is equipped with 2 lasers: a blue 488nm (3 detectors + FSC/SSC; FL1 [530±15 nm], FL2 [585±20 nm], FL3 [>670 nm]) and a red 640nm (1 detector; FL-4 [675±12.5 nm]). The optical configuration allows multi-parameter detection of up to 4 fluorescent parameters and 2 light scatter parameters. The system is operated using CFlow Plus software. Optical filters allow for detection of commonly used fluorescent markers, including, but not limited to: FL1- FITC, AF488, GFP, CFSE, YFP; FL2- PE, PI; FL3- PerCP, PerCP-Cy5.5, PE-Cy7, RFP, mCherry; FL4- APC, AF647, APC-Cy7, APC-H7. The BD Accuri C6 is located in the MSU South Campus Flow Cytometry Core (Room 2521, IQ Building).

**BD FACS Aria IIu:** The BD FACS Aria IIu is equipped with 3 lasers: a 405nm violet (4 detectors), a 488nm blue (6 detectors + SSC), and a 633nm red (3 detectors). The optical configuration allows multi-parameter detection of up to 13 fluorescent parameters and 2 light scatter parameters. The system is operated using BD FACSDiva software. The instrument is capable of performing both acquisition/analysis of samples, in addition to its main cell sorting function. The BD FACS Aria-IIu is equipped with BD Accudrop and Sweet Spot technologies that increase sort accuracy and stability. The sorter is capable of high-speed sorting through over  $50 \times 10^6$  cells per hour with up to four populations simultaneously and ability to sort for single-cell applications. An Automated Cell Deposition Unit, ACDU, is integrated to allow for sorting cells into microtiter plates up through 96-well layouts. The sorter is fitted with 70, 85, and 100  $\mu$ m nozzles to allow for sorting a wide variety of cell types. The instrument is installed in a Baker BioProtect IV Class II Biosafety Cabinet to allow for appropriate sorting of BSL-2+ samples. The Biosafety cabinet provides a means to evacuate the sort collection chamber and traps aerosols that may be generated during the sorting process. The BD FACS Aria IIu is located in the MSU South Campus Flow Cytometry Core (Room 2522, IQ Building).

**Luminex-200 System:** The Luminex 200 System is a diagnostic instrument that performs bead-based multiplex (96-well format) analysis of up to 100 analytes simultaneously in a single small volume samples. This system utilizes fluorescently labeled microbeads that are conjugated with a specific reagent (eg, antibody, antigen, enzyme substrate, etc.) to enable capture and detection of analytes of interest. The Luminex 200 is equipped with 2 lasers: a 635nm classification laser for excitation of fluorescently-labeled microbeads and a 532nm reporter laser for excitation of the analyte signal. The Luminex 200 has a dynamic range typically  $\geq 3.5$  logs. A handheld magnetic plate washer, microtiter plate shaker, bath

sonicator, and vortexer are available in the Core Facilities to enable multiplex assay performance. Operation of the system and data analysis are performed using the Luminex XPonent Software. Commercially available and custom multiplex kits can be utilized to quantify mouse, rat, and human protein expression (ie, cytokines, growth factors, phosphoproteins, etc.) in a variety of samples types (ie, cell culture media, plasma, serum, BALF, cell lysates, etc.). In addition to immunoassays, the platform can be used for enzyme assays, genotyping, gene expression analysis (*Quantigene, ThermoFisher*), or assessment of protein-protein interactions. The Luminex 200 is located in the MSU South Campus Flow Cytometry Core (Room 2521, IQ Building).