**[Flow Cytometry Core Facility](http://bauercore.fas.harvard.edu/flow-cytometry)**

**URL:** <http://bauercore.fas.harvard.edu/flow-cytometry>

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**Laboratory Manager:** Claire Hartmann (formerly Reardon)

Please contact the flow core (flowcore-list@lists.fas.harvard.edu) if you plan to submit a grant proposal referencing resources in this core, and the staff will help you to select instruments and plan your experiments.

**Description:**

*Square Footage:* 1,227 square feet

*Facility Location:* Northwest Lab, Room B239

We provide access to cell sorters, analyzers, and particle counters. Researchers may be trained to independently use our analyzers, particle counter, and some of the cell sorters. The core staff provide sorting services on our FACSArias, MoFlos, and Biosorter instruments. Researchers that require sorting on a frequent basis can be trained to run the FACSArias, or Biosorter for themselves.

**Major Equipment:**

* The Beckman Coulter MoFlo Astrios EQ is a high-speed cell sorter with 7 lasers, 34 detectors, and 6-way sorting capability.  It is equipped with a 355nm, 405nm, 488nm, 532nm, 561nm, 592nm, and 640nm lasers. It has dual forward scatter PMT small particle detectors that allow for the measurement of submicron particles. Common nozzle sizes used on the instrument are 70 and 100 micron.  It is inside a biosafety cabinet and it can be used for sorting BL2 samples.  Supported collection devices can be used include: microscope slides, micro tubes, 12x75 test tubes, 15ml or 50ml falcon tubes, and multi-well plates (6, 24, 96, 384, 1536, or custom) with index sorting.  The collection device and the sample chamber can be cooled or warmed during sorting.  The Astrios is capable of sorting into plates with the sort stream straight down instead of at an angle like most traditional sorters. This instrument is operated by staff on a fee for service basis.
* The Beckman Coulter MoFlo XDP Cell Sorter is a high-speed cell sorter with 4 lasers, 9 colors, and 4-way sorting capability. It is equipped with a 488nm, 405nm, 561nm, and 635nm lasers. The XDP uses complete digital processing and can sort with high yield at high efficiency. A variety of collection devices may be used including: microscope slides, micro-tubes, 12 x 75ml test tubes, 15 or 50ml falcon tubes, as well as multi-well plates (6, 24, 96, 384, or 1536). The sort collection device may be cooled or warmed while sorting. It is inside of a biosafety cabinet and can be used for sorting BL2 samples. This instrument is operated by staff on a fee for service basis
* Beckman Coulter MoFlo Legacy Cell Sorter is a high-speed cell sorter with three lasers, 9 colors, and two-way sorting capability. It is equipped with a solid state 488nm laser, an I90 argon ion multiline UV laser, and an I70C spectrum tunable laser (providing wavelengths from 440nm to 568nm). A variety of collection devices may be used including: microscope slides, micro-tubes, 12 x 75ml test tubes, 15 or 50ml falcon tubes, as well as multi-well plates (6, 24, 96, or 384). This instrument is operated by staff on a fee for service basis.
* The core has two BD FACS Aria cell sorters which each have five lasers, 18 detectors, and 4-way sorting capability. Aria #1 is a model IIIu and has 405nm, 440nm, 488nm, 561nm, and 635nm lasers. Aria #2 is a special-order Aria II with 355, 405, 488, 561, and 637 lasers. Both instruments may be used to sort BL2 samples. Only mammalian cells are allowed on Aria #2. Both Arias use FACS Diva version 7 and can sort into a variety of collection devices including: microscope slides, micro-tubes, 12 x 75ml test tubes, 15ml falcon tubes, and multi-well plates (6, 24, 96, or 384) with index sorting. The collection device can be cooled or warmed during the sort. Common nozzle sizes include the 70 micron, 85 micron, 100 micron, and 130 micron. The fixed nozzle eliminates the need for laser alignment with every run and makes this instrument easier to use than the MoFlo.  For this reason, people who anticipate heavy use and who have already taken the LSRII/Fortessa training can be trained to use it independently.  Users who need it less frequently can have their samples run by the facility.
* The Union Biometrica BioSorter is a large particle sorter designed for objects that are too large for traditional droplet cell sorters. The instrument is configurable with different sized flow cells that range from 250 microns up to 2000 microns. The core facility currently has the 250 and 1000 micron flow cells. The 250 micron flow cell can handle adult C. Elegans or similar sized objects. The 1000 micron flow cell can handle Zebrafish larvae or similar sized objects. The BioSorter is configured with three excitation lasers: 405nm, 488nm, and 561nm. It has three detectors for fluorescence as well as extinction and time of flight measurements. Samples are introduced via a 50 ml falcon tube and mixed with a suspended stirrer. The associated LP sampler can take samples from 96/384 well plates, and the instrument can sort into a variety of collection devices including tubes and 96/384 well plates
* BD FACSymphony A3 Lite: This analyzer has 5 lasers (355, 405, 488, 561, and 637 nm) which can be used to analyze cells and particles stained with many different fluorophores. The high throughput sampler (HTS) allows cells to be taken from a 96 or 384 well plate. Researchers can be trained to use this instrument independently.
* BD LSR Fortessa: This analyzer has 4 lasers (440, 488, 561, and 633 nm) and can be used to analyze cells stained with many different fluorophores (fluorescent proteins, DsRed, mCherry, APC, and phycoerythrin, among others).  The high throughput sampler (HTS) allows cells to be taken from a 96 or 384 well plate. Researchers can be trained to use this instrument independently.
* Beckman Coulter Multisizer: The Multisizer 3 Coulter Counter is a particle sizing and counting analyzer. The coulter counter uses an Electrical Sensing Zone Method to generate data on number, volume, mass, and surface area size distributions of particles. Apertures of 50 µM and 100 µM are currently available to measure particles ranging from 1-60 µM in diameter. Researchers can be trained to use this instrument independently.
* The Logos LUNA-FL and LUNA-FX7 are bench top automated hemocytometers designed for accurately measuring cell counts, cell size, clumping ratio, and viability using bright field and fluorescence. They use disposable plastic slides which can analyze up to eight samples using 10µl of sample. Samples can be stained with trypan blue for bright field, or with an Acridine Orange and Propidium iodide mixture for fluorescence. Cell images are analyzed with on-board image analyzing software. Researchers can be trained to use this instrument independently.