Yale Flow Cytometry Core

Purpose

To provide comprehensive cytofluorometric analysis and sorting to the YCC investigators. The facility not only provides, maintains, and operates the instruments, but also trains users, develops techniques, provides protocols, and manages access and the financial aspects of the Shared Resource.

Key Services

- Multiparameter flow cytometric analysis (user operated)
- Multiparameter fluorescence activated high speed cell sorting (operator-assisted)
- Training in the use of FACS analyzers and the FACS Aria sorters.
- Consultation on experimental design and interpretation.
- Data analysis stations with state-of-the-art analysis software

Major Equipment and Locations

**BD FACS Aria**
- Locations: 300 George St. 2320H, Amistad 416, and TAC 617 and 633
- Temperature controlled sorting
- Tube, Index-sorting, and Slide or Plate-sorting
- 71, 85, 100, 130-micron nozzles

**FACS Aria Sorters in Bio-safety Cabinets**
- Locations: LEPH 901B and Amistad 416
- Sorting Unscreened Human Material
- LEPH: BSL-2 and BSL-3 Pathogen Sorting

**MoFlo**
- Location – TAC S517
  - 3 laser, 8-compensated color sorting
  - Tube, slide, or plate sorting
  - Sorting Concentrations up to 6x10^7

**LSRII**
- Locations – 300 George St. 2320H, Amistad 416, and TAC 533 and 613
  - 3, 4, and 5 laser systems
  - +12 to 18 PMTs for fluorescence detection

**Stratagene**
- Locations – TAC S533 and S613
  - 3 and 4 lasers systems
  - 6 or 13 PMTs for fluorescence detection
  - Plate loader acquisition capability

**Amnis**
- Location – TAC S613
  - Rapid acquisition of flow cytometric data and high resolution images of individual cells
  - 20x, 40x, and 60x objectives

**Remote Data Access**

- A data mirror system allows users to access their exported data remotely.
- A server synchronizes with the ftp export folder of each of the LSRII computers daily. Copies of the export folders are created each morning between 4-6 am. The data is then accessible for users to retrieve remotely from the server or from our stand alone computers workstations outside of TAC S613.

- It is also possible to export data within Diva software at a halfway workstation. Sample acquisition can take longer than expected, so when time is short at the cytometer, data export can now be completed away from the cytometer. This also obviates the need to reserve more time on the equipment later simply to export your data.

**Fluorophore Detection**

A. Nuclear translocation during cell signaling

B. DNA content and cell cycle analysis

C. Analysis of DNA fragmentation

**Specialty Sorting**

The FCSR cells sorters have a variety of special features not realized by many users:
- Temperature Controlled collection (cooling or heated collection)
- Plate, Eppendorf, and slide deposition
- Single-cell plate sorting
- Amplifying sort collection
- Multiple nozzle options to accommodate a cells from 0.5 to 65-microns using sheath pressures from 5 to 70 PSI

**Index Sorting**

Index sorting provides sort information on event-by-event basis. The index sort mode creates an FCS file containing data on the X and Y coordinates of the cells that can be traced back to the flow characteristics of the cell or combination of cells sorted, providing a complete flow phenocopy for every sorted cell. Index sorting can be an important tool in stem cell sorting, clonal selection, single-cell sequencing, and drug testing.

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