MISSION
To serve University of Iowa investigators by providing state-of-the-art flow cytometry services in an environment that invites innovative approaches to understanding biological systems.

EQUIPMENT
Becton Dickinson FACS Aria II
- Five laser excitation (355nm, 405nm, 488nm, 561nm, 640nm)
- High speed sorting/Simultaneously sort four populations
- Single Cell Deposition in 96-well plates (cloning)
- Sixteen parameter analysis (14 colors plus forward and side scatter)
- Semi-automated fluorescence overlap compensation
- Instrument biologically contained inside biosafety hood

Becton Dickinson FACS Aria Fusion SORP
- Three laser excitation (405nm, 488nm, 640nm)
- High Speed Sorting/Simultaneously sort four populations
- Single cell deposition into 96-well plates (cloning)
- Fourteen parameter analysis (12 colors plus forward and side scatter)
- Semi-automated fluorescence overlap compensation

Cytek Aurora Spectral Flow Cytometer (2 each)
- Five laser excitation (355nm, 405nm, 488nm, 561nm, 640nm)
- 62 parameter analysis (40 color panel currently)
- Violet small particle SSC detection
- 96-well plate reader

BioRad BioPlex
- System for investigating protein expression, genomics, or immunodiagnostics
- Multiplexing allows up to 100 analytes per sample
- Cytokines quantified in pg/ml
- Small sample size (12ul for serum)

Milenyi AutoMACS
- Magnetic cell sorting of up to 2x10^8 labeled cells

Leitz Fluorescent Microscope
- UV, blue, and yellow excitation allows viewing of most common fluorochromes.

FACILITY DESCRIPTION
The 1,200 square foot Flow Cytometry Facility is located in the Eckstein Medical Research Building (EMRB). The facility has one magnetic-based and 8 laser-based instruments whose major purpose is the identification and isolation of various cell populations. The laser-based instruments accomplish this by the use of antibodies to which various colors or dyes have been attached and are directed at molecules known to exist on the cell surface. By using several colors attached to different antibodies, one can identify and purify cells that express any given configuration of various molecules.

SERVICES PROVIDED
- High-speed sorting
- Multi-parameter analysis
- High-efficiency purification of cell subsets/single cell deposition (cloning)
- Quantification of cytokines, gene expression, micro RNA
- Training and assisting investigators and laboratory personnel in the use of software programs for the interpretation and analysis of data
- Individual training of investigators and laboratory personnel in the use of bench-top instruments
- Consultation for experiment design
- Online instrument scheduling provided through web-browser interface
- All data stored on a dedicated server managed by University of Iowa Information Technology Services

FUTURE DIRECTIONS
- Amnis ImageStream (combines image analysis with flow cytometry)
- Spectral Flow Cytometer Cell Sorter (High parameter cell sorting)

EXAMPLES OF DATA
Mouse bone marrow stained with seven colors and sorted on the BD FACS Aria II cell sorter:
- CD3/CD4/CD8/CD11c/CD5 (FITC), B220 (A700), CD43 (Qdot 605), BP-1 (PE), CD19 (PE-Cy7), CD135 (APC), and CD127 (BV421) excited with 405nm, 488nm, 561nm and 640nm lasers. Data courtesy of Dr. John Colgan.

Mouse Bone Marrow Pre-sort Populations
- Data courtesy of Dr. George Weiner

T-SNE Data Analysis
- Data courtesy of Dr. George Weiner