## Cell and Immunobiology Core

More info: <https://research.missouri.edu/cell-immunobiology>

The Cell and Immunobiology Core (CIC) is hosted by the Department of Molecular Microbiology & Immunology in the School of Medicine. It provides custom monoclonal antibodies, flow cytometric analysis, mitochondrial respiration and glycolysis measurements, and tissue culture reagents via three subcores and a supply center.

The CIC tissue culture lab offers the preparation of normal and tumor cells for in vivo and in vitro experiments, mycoplasma testing, and the revival and preparation of cell lines and hybridomas for long-term storage in liquid nitrogen. Experiments are custom designed to meet the needs of the researcher and new approaches and techniques are open for discussion and consideration. The CIC can also produce highly concentrated (0.5 to 1.5 mg/ml) monoclonal antibody preparations free of serum and circulating host immunoglobulins.

The Flow Cytometry Subcore offers powerful technology for analyzing and sorting the suspension of microscopic particles at thousands of events per second. The technique utilizes fluorescent probes targeted at cell-specific antigens to characterize the physical and/or chemical characteristics of single cells. Fluorescence-activated cell sorting (FACS) coupled with analysis can identify and isolate live cells from a defined phenotype that can be expanded in culture or animal models and further analyzed. It features two cell sorters and three analyzers. The newest sorter, the ThermoFisher Bigfoot full-spectrum sorter, detects up to 48 colors. This instrument, as well as the Beckman Coulter MoFlo XDP, is optimal for sorting fragile cells and can sort up to 70,000 events per second. The Bigfoot sorter provides standard six-way sorting and accommodates up to 1,536 well plates. The analyzers include a Cytek Aurora spectral analyzer, a Beckman Coulter CyAn ADP, and a Beckton Dickinson LSRFortessa X-20. Fluorescent applications include immunophenotyping, cell cycle analysis, green fluorescent protein (GFP) expression, and apoptosis detection. Sterile sorting options for the Vantage include bulk collection of purified cell populations and single cell deposition for subcloning. The FACScan is a three-color, non-sorting, benchtop system that allows trained investigators to run their samples at a reduced rate. Apple computer workstations are available for data analysis.

The Seahorse XFe96 analyzer simultaneously measures the two main pathways of cellular energy – oxygen consumption rate (mitochondrial respiration) and extracellular acidification rate (glycolysis). These measurements provide information about the altered mitochondrial function frequently observed during the aging process and in disease and pathological states. Experiments are carried out rapidly and in real-time in a microplate format using label-free technology, and they can provide insight about energy demand and substrate availability. Assays can be performed with adherent cells, suspension cells, isolated mitochondria, C. elegans, zebrafish, and yeast. Four drug injection ports are available per well for the addition of inhibitors, stimulants, substrates, and compounds.

Finally, the Supply Center provides commonly used tissue culture media, supplements, sera, transfection reagents, and Bio-Rad products at substantial savings. A few of the products are heat-inactivated, and the source of the serum is either U.S. origin or non-U.S. origin but USDA-approved. A small number of products essential for protein gel electrophoresis and Western blotting are kept in stock. These products include pre-cast gels, acrylamide solutions and polymerizing reagents, buffers, membranes and filters, western blot detection reagents, supplies to prepare gels, and prestained protein molecular weight markers. The facility also provides antibody reagents, which play a key role in many research projects. Common applications include flow cytometry, ELISAs, immunofluorescence, immunohistochemistry, immunoprecipitation, proteomics, and western blot analysis. Purified antibodies are often available in unconjugated form or conjugated with an enzyme or fluorochrome.