**SIU SCHOOL OF MEDICINE**

**CORE FACILITIES**

**Laboratory Animal Resources at SIU Medicine, Springfield**

The animal facility is a 20,000 square foot AAALAC accredited facility operated by the Division of Laboratory Animal Medicine under the Associate Dean for Research. The animal care and use program is operated in compliance with all local, state and federal regulations and policies, inspected yearly by USDA APHIS and holds a current assurance with NIH OLAW. Animal care is provided every day of the year by trained animal care technicians and emergencies are handled on an on-call basis. Staff include a full-time ACLAM board certified Director/Attending Veterinarian, certified veterinary technician, and animal care coordinator who supervises the technicians. Multiple species can be housed in the facility with conventional, barrier, and containment/quarantine housing available for rodents. Within the facility, procedure rooms, a surgery suite, necropsy room and containment (ABSL2) areas are available for investigator use. The Laboratory Animal Care and Use Committee (LACUC) oversees animal welfare and research use involving all live, vertebrate animals at SIU Medicine.

**Flow Cytometry Facility**

The Flow Cytometry Facility occupies approximately 300 square feet and is a fully equipped high speed cell sorting and cell analyzing research laboratory. The Becton-Dickinson FACSAriaII (special order) high-speed cell sorter, features five air cooled lasers (UV 355nm , violet 405nm, blue 488nm, yellow-green 561nm, and red 640nm), multicolor analysis up to 10 parameters and four way sorting. Additionally, the instrument is equipped with an Automated Cell Disposition Unit (ACDU) module which allows for single- or multiple- cell sorting into several different plate configurations and housed in a Baker Bio Protect-II bio-safety cabinet, which enables sorting of BSL-2 level samples. The Becton-Dickinson FACSCalibur benchtop flow cytometer features two lasers (blue 488nm and red 635nm) with four color capability. The Accuri C6 bench top trained user operated flow cytometer features two lasers (blue 488nm and red 649nm) with four color capability. Luminex-BioPlex Array Reader enables multiplexing of up to 100 analytes in a single microplate well, using very small sample volumes, on many assay formats including nucleic acid assays, receptor-ligand assays, immunoassays and enzymatic assays. The Flow Cytometry Facility has FCS Express software available to users for analysis at no cost to them. The laboratory has a full time experienced operator who assists researchers in the development of protocols, instruction of flow cytometric techniques, and oversees daily operation of the facility.

**Imaging Core Facility**

The Research Imaging Facility (RIF) provides approximately 2900 square feet of laboratory space dedicated to imaging and quantitative analyses. The facility is staffed by a full time coordinator that provides education and training for equipment, technical support, protocol development, and contractual research projects. Trained researchers have 24-hour access to the equipment, 7 days a week. The RIF features the following equipment:

1. **Leica SP5 II** scanning confocal microscope (laser lines 405, 458, 476, 488, 496, 514, 543 and 633nm) is equipped with a DMI 6000 inverted microscope with a motorized stage, a temperature control chamber and CO2 control system, this system is ideal for live imaging experiments as well as basic confocal applications.
2. **Zeiss LSM800** scanning confocal microscope (laser lines 405, 488, 561, and 640nm) is an inverted platform equipped with the Airyscan array detector with increases detection resolution by 1.7X. The LSM 800 is a high resolution confocal with “Super-Resolution” performance. Zen software is used for acquisition and analysis.
3. **Olympus IX70** inverted reflected light fluorescent microscope with 5x, 10x, 40x, 60x objectives, features blue(EX=470-490nm), green(EX=530-550nm), red(540-650nm) fluorescent cube turrets. The scope uses a DP80 Dual Color-Mono Camera with Cell Sense acquisition software and Metamorph software for analysis.
4. **Hitachi S-3000** scanning electron microscope with secondary and backscatter electron detectors is equipped with a large chamber area, low-vacuum viewing mode and a cold stage option. Core laboratory staff offer specimen processing for EM samples.
5. **Hitachi H-7000** transmission electron microscope, complete with scanning TEM (STEM), small sample SEM capabilities, and fitted with an AMT digital camera system.
6. **Olympus SZH10** stereo-microscope with zoom from 0.7x to 7x.
7. **LiCor Odyssey** imaging system with near infrared fluorescence for greater signal sensitivity and reduced auto-fluorescence (700 and 800 nM). The Odyssey can accommodate blots, gels, culture dishes, multi-well plates and tissue sections. Double-labeled samples can be used and the high signal-to-noise ratio allows images to be calibrated to the pico-gram range.
8. **Syngene G: Box Chemi XT** chemiluminescence imaging system equipped with a 4.2 megapixel, cooled (-28°C absolute and regulated) CCD camera and 16 bit A/D, providing a contrast of over 65,000 grey levels. The system is equipped for capturing and analyzing luminescent, fluorescent (trans-illuminated UV or epi-illuminated blue, green, red and near-IR) or bright-field images from a variety of materials, including Western blots, DNA gels, culture dishes or multi-well plates.
9. **IVIS Lumina II** is a highly sensitive, low light-level system specifically designed to non-invasively observe and quantify the progression of physiological events (such as tumor growth, infection, nerve regeneration) at multiple time points within the same subject. The system features a highly sensitive, cooled (-90°C) CCD camera to detect low-level light emissions from luciferase-tagged cells and is also equipped with a xenon lamp and filter sets for GFP, DsRed, CY5.5 and ICG for *in-vivo* fluorescence studies.
10. **Life Technologies Quant Studio 3** real time PCR instrument offers a 96 well, 0.2ml platform can analyze 4 targets in one plate. The instrument offers 6 temperature zones for experiment optimization.
11. **Life Technologies Step One Plus** real time PCR. The core offers two Step One Plus instruments with a 96 well, 0.2ml platform. These instruments offer 6 temperature zones.
12. **BioTek Synergy HTX Multi-Mode Microplate Reader** accomodates 6- to 384-well microplates, to detect absorbance and fluorescence using a unique dual-optics design for superior performance. Absorbance detection optics uses a xenon flash lamp and monochromator for filter-free wavelength selection from 200 to 999 nm in 1 nm increments. Fluorescence detection is via a tungsten halogen lamp with interference filters in conjunction with a PMT detector for maximum sensitivity.
13. **Agilent Seahorse XFp** measures the flux of oxygen, the oxygen consumption rate [OCR], proton flux, extracellular acidification rate. [ECAR]. Seahorse XF instruments measures these two energy pathways simultaneously in an 8 well miniplate format.
14. **ThermoScientific HM525 NX Cryostat** with intuitive software and touchscreen for simple, efficient operation enables sectioning from 1µm to 500µm with cryochamber cooling to -35°C and a fast freezing to -57°C ± 3°C.
15. **Meso Scale Discovery QuickPlex SQ 120MM Reader** offers single and multiplexing assays using high-performance electrochemiluminescence. Combines rapid read times and the ability to perform multiple, simultaneous tests on a single sample increasing productivity. Designed to save sample and offer customizable assays with a wide range of analytes available.

**Statistics and Research Informatics Core**

The Statistics and Research Informatics Core provides research and statistical services to faculty at the School of Medicine to assist faculty researchers in any way that facilitates their research productivity. PhD and masters’ level statisticians and data analysts have over 30 years of experience in creating statistical models and study designs for basic science, clinical, educational, population, genomic, and translational research. Consultation provided covers a wide range of research and statistical issues, including conceptualization of research problem, experimental design for rigor and reproducibility, statistical analysis of data, interpretation and presentation of statistical findings, and summary of research results. The Core has nine Dell computers running on Intel i7 processors. Available statistical software packages include SAS 9.4, Stata 14.0, SPSS 24.0, ArcGIS 10.3.1, JMP 12.2, and R 3.3.0.

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