**CHARLES E. SCHMIDT COLLEGE OF MEDICINE – FACILITIES AND RESOURCES**

*Use what you need, this is only a template, tailor to your grant*

The **Charles E. Schmidt College of Medicine (COM)** was officially approved to grant the Medical Degree by the Florida Universities Board of Trustees and the state of Florida in 2010. Currently the COM is comprised of three academic departments; Integrated Medical Sciences, Biomedical Science and Surgery. Faculty from all three departments are involved in the MD program’s “Integrated Patient Focused Curriculum”, which focuses on the principle that future physicians should learn essential basic science information in the context of patient care, patient case studies and the practice of clinical skills.

**FAU Comparative Medicine Core**. The animal care and use program at Florida Atlantic University is centralized and directed by a full-time veterinarian, trained in laboratory animal medicine and board certified by the American College for Laboratory Animal Medicine (ACLAM). The Veterinary Staff comprises of the Attending Veterinarian and Assistant VP for Research, Comparative Medicine; the Director, Veterinary Care (DVM, Diplomate ACLAM) who is also trained in veterinary pathology; a part-time clinical veterinarian specialized in marine/wildlife species and a Veterinary Technician. The Assistant Director, Administration and Training Coordinator (M.S.) fulfills the federal mandate of training all personnel participating in handling, care and experimentation involving animal models. In addition, the animal care program employs an Assistant Director, Lab Animal Facilities (B.S., CMAR) who supervises nine (9) Laboratory Animal Technicians many certified by AALAS and two (2) student workers. They take care of the daily operations in the six (6) centrally managed facilities located at two campuses. Health assessment is performed and documented for all animals, 7 days per week.  A comprehensive rodent health surveillance program for monitoring pathogenic agents and animal well-being is in place for the animal care program. FAU has an Animal Welfare Assurance on file with NIH-OLAW (Assurance Number D16-00507) and is registered with USDA/APHIS. The FAU Animal Care and Use Program is AAALAC accredited (accreditation # 001742) and fully complies with Animal Welfare Act/Regulation, the Guide for the Care and Use of Laboratory Animals (The *Guide*), the Public Health Service Policy on the Humane Care and Use of Laboratory Animals (PHS Policy), and all state as well as local regulations. Special attention is paid to anesthesia and analgesia to reduce pain/distress when applicable. Pain relief will be provided based upon the approved protocol or if need be, veterinary intervention.

**College of Medicine Facility (BC-71)**. The COM animal facility is a modified barrier 4,200 sq. ft. vivarium that houses mice. The facility contains three animal housing rooms, one of which is equipped with three individual cubicles allowing separation of animals by specific study projects, e.g., use of viral vectors, reversed light cycle, or immunocompromised strains such as humanized or SCID mice. The other two rooms are routine mouse housing rooms. Mice are housed in individually ventilated cages and water provided via water bottle in all caging systems. Cage change is accomplished using changing stations (i.e., laminar flow hoods) or a Biosafety Cabinet. Individual cubicles are opened only one at a time if applicable.

Animals are fed dedicated irradiated rodent chow (5L0D PicoLab® Laboratory Rodent Diet and 5LJ5 PicoLab® High Energy Mouse Diet). Environmental parameters such as temperature, humidity, ventilation criteria and light are controlled and/or monitored via a computerized “Watchdog EX” system in all housing areas. Caging and supplies are sanitized through a rack washer and/or sterilized via an autoclave within the facility. The vivarium contains a surgical suite, a multipurpose room with a backdraft table, and four (4) procedure rooms mainly used for behavioral testing. An additional suite adjacent to the vivarium is dedicated to BSL2 work with an ante room and a procedure room containing a Biosafety Cabinet Type 2B. Therefore, animal biohazard level 2 (ABSL2) studies can be supported in this facility.

Animals are not allowed to be returned from individual research labs once they left the vivarium. Restricted access and PPE such as disposable gowns and gloves are required for entry to the animal facility. The vivarium is serviced by dedicated animal care staff.

**Research Support Facility A (RSFA – 35A)**. The RSFA animal facility is a conventional 3,500 sq. ft. vivarium that houses aquatic species and rats. Larval salamander and freshwater turtles are housed in tanks with recirculating water systems. Feed is provided, water quality monitored and cleaning performed per species-specific SOP. Rats are housed in individually ventilated cages and water is offered via water bottle. Cage change is accomplished using changing stations (i.e. laminar flow hoods). Animals are fed dedicated rodent chow (5L0D PicoLab ® Laboratory Rodent Diet). Environmental parameters such as temperature, humidity, ventilation criteria and light are controlled and/or monitored via a computerized “Watchdog” system in each housing room. Caging and supplies are sanitized through a rack washer and/or sterilized via an autoclave in the facility as applicable. A surgical suite, several procedure rooms, and a necropsy room with a downdraft table are available within the vivarium. BSL2 studies (viral vectors) can be supported in this facility. Animals can be returned from individual research labs as approved by the AV. Restricted access and PPE such as disposable gowns and gloves are required for entry to rodent housing area.

**FAU Biostatistics Collaborative Core.** The FAU Biostatistics Core provides access to high quality biostatistics support to investigators involved in health-related research.

**FAU Clinical Research Unit (CRU).** The CRU is a state-of-the-art facility expanding the clinical research capacity of FAU with 8000 square feet of research space specifically designed to conduct clinical trials, longitudinal studies, and patient-oriented research projects. The CRU includes: a large, comfortable waiting area for participants and families with computer workstations; 3 infusion suites; 4 exam rooms; 2 rooms for private testing; DEXA machine and anthropometric measurements; GAITRITE gait and balance lab; biospecimen processing and storage facility. CRU services include IRB and other regulatory support; budget development and contract negotiation in collaboration with Sponsored Programs; expert study coordination; and sample processing and/or shipping.

**FAU Brain Institute Resources***.* The FAU NeuroBehavior Core within the Brain Institute provides equipment and training to test mice using automated measures of locomotor, cognitive and emotional behavior. The Core also possesses a dedicated room for monitoring rodent behavior while undergoing microdialysis and/or optogenetic stimulation. This FAU NeuroBehavior Core provides additional paradigms for mouse testing as needed, including automated home cage testing, social behavior assessment, circadian rhythm monitoring, and metabolic monitoring.

The FAU Cell Imaging Core within the Brain Institute provides imaging services and light microscopy equipment to support scientific and clinical investigators at FAU and other institutions. Across the Boca and Jupiter campuses, the core houses five imaging systems, covering a variety of light microscopy techniques. Additionally, the core provides five powerful image data analysis workstations with advanced imaging software. Services of the FAU Cell Imaging Core include training on the equipment and experimental support. FAU’s Brain Institute entered a partnership with Nikon and became one of Nikon’s Centers of Excellence in 2016. Through this partnership, FAU and the Core have access to the latest optical systems (Nikon N-SIM E and A1+R combined Super Resolution and Confocal Imaging System) and benefit from excellent support by Nikon specialists.

**COM Shared Facilities**

The COM provides state-of-the-art resources and shared facilities to support research activities. The following facilities are located within the College of Medicine main building on the Boca Raton campus and available for use by the faculty, staff, post docs and students.

Induced Pluripotent Stem Cell (iPSC) Facility: A full-time research assistant professor manages and provides service in this facility related to genome editing, culture, and differentiation of iPS cells for use in human disease modeling. The facility contains all necessary equipment, including a Sorvall Legend XIR centrifuge, Nikon Inverted Microscope, ThermoScientific CO2 incubators, Invitrogen neon transfection system, Biological Safety Level-2 Cabinets, and a Revco -135 ultralow freezer.

Molecular Facility:Two facilities offer two sets of the following equipment, an Applied Biosystem SimplyAmp Thermocycler, Agilent AriaMX Real-Time PCR System, Vortexer, MX300SP Stratagene Q-PCR, Nanodrop ND 8000 Spectrophotometer, Agilent 2100 Bioanalyzer, Agilent Tapestation, Microbeta scintillation counter, and Thermofisher QUBIT 4 Flourometer Wifi Box.

Imaging Facility: The facility includes: a Carl Zeiss Microimaging LSM 700 Confocal Laser Scanning System, Licor Odyssey Infared Imager, Bio-Rad TransBlot Turbo, VWR e5430r refrigerated benchtop micro centrifuge, UVP EpiChemi II Darkroom, Hybridization Oven, and ~~Storm Phosphorimager.~~

Cell Analytics Facility:The facility includes BD FACS Calibur Analyzer, Orflo Moxi-Go, ACEA Biosciences xCELLigence RTCA DP system, Hypoxia chamber, and MEA2100 system (multi-microelectrode arrays).

Genomics Facility: The facility includes a VWR epMotion 5073 liquid handling robotic system, Diagenode Pico Disruptor, Oxford Nanopore Sequencer and 10x Chromium ix. Also available are FreezerWorks laboratory management software and -135 freezer.

Proteomics Facility:The facility includes a FPLC, Lablanco freeze zone 4.5 plus, Bio Rad Protein Purification System, BMG LabTech CLARIOstar and Fluostar.

Histology Facility**:** The facility includes 2 Leica cryostats (CM1850 and CM1860), microtomes, and paraffin embedding station.

**Max Plank Core.** Through a reciprocity agreement, FAU faculty and trainees have access to the specialized core facilities at the Max Planck Florida Institute of Neuroscience located on the FAU Jupiter campus. These include the following core facilities:

Electron Microscopy Core. Instrumentation includes a FEI Tecnai transmission electron microscope, Zeiss Merlin VP Compact scanning electron microscope, High-pressure freezing system (HPM100), Automatic freeze-substitution device (AFS), Cryo-preparation system (CPC), Ultramicrotome (UC7), and a Freeze-fracture system (JFDV). The facility is also capable of Serial Block Face Scanning and Serial Automated TEM EM.

Microscopy Core: The Optical Workshop and Light Microscopy Core provides state-of-the-art technology includes a Zeiss LSM 780 confocal system, Leica SP5 II resonant confocal system, and a Prairie Moving In Vivo Multiphoton system.

Mechanical Workshop: The Mechanical Workshop designs and builds commercially unavailable equipment and customizes existing tools for use in novel research methods by MPFI scientists. The Mechanical Workshop features a 5-axis high-speed CNC milling machine and a 3+2-axis CNC milling machine.

**Scripps Florida Core.** Through a reciprocity agreement, FAU faculty and trainees have access to the specialized core facilities at Scripps Research Institute of Florida. These include the following core facilities:

Flow Cytometry Core: Instrumentation includes: BD FACSAria3, BD FACSAria Fusion, BD LSR2, Beckman Coulter Gallios, BD Canto, LCM microscope, Hemavet 950FS, BD 12x75mm tube with cell strainer cap, and LEICA LMD 7000.

Genomics Core: Tools include: Illumina NextSeq500, ABI SOLID5500 and EZ Bead system, Ion Torrent Personal Genome Machine, Ion Torrent Proton, Affymetrix GeneChip System, Quantitative RT-PCR: a Roche Light Cycler 480 instrument and an Applied Biosystems A Step One Plus instrument, Agilent 2100 Bioanalyzer and Tapestation 2200, and a Hamilton Microlab STARlet Robotic Liquid Handler Unit.

High-Throughput Screening: This center includes a dedicated Agilent 1200 series LCMS with multimode mass spectrometry (ES, APCI, ELSD) dedicated for quality control of incoming HTS compound libraries and hit confirmation efforts.

Microbiology: This lab is equipped with Class II hoods, refrigerators and freezer storage, bulk reagent dispensing, microplate reading and is even capable of HTS screening BSL-2 organisms in 1536-well microplates. For molecular research PCR machines and post-PCR equipment is available allowing for cloning and expression work to be done. For large scale protein purification there is an Akta FPLC installed inside a double glass door refrigerator. Time kill and bacteria kinetic assays are facilitated by Spiral Biotech spiral platers and Qcount imaging colony counters. We have cutting edge imaging apparatus to allow visual inspection of membrane active compounds and have implemented one of the most advanced and sensitive methods for the early detection of anti-proliferative effects by inhibitors.

High Performance Computing: The primary HPC cluster, named “Sepa,” currently consists of more than 456 processors and 456 GB of distributed memory. The system uses a distributed batch queuing system called “Sun Grid Engine.” This software provides researchers with simple ways to submit complex jobs to the compute cluster. In addition to the HPC cluster, there are also several small-scale SMP machines for memory-intensive tasks. Also, two large dedicated SMP machines are available. These machines each have 128 GB of RAM and 32 cores, making them ideal for large computational tasks that cannot be run on the HPC cluster. Connections of up to 10 Gb/s to peer research institutions are possible over the National LambdaRail and Internet2 research networks. Scripps Florida also maintains a large-scale tape backup and disk archival system. The system is capable of scaling to provide up to 2.4 petabytes of uncompressed capacity.

Histology: The Scripps Florida Histology Core (SFHC) is equipped with the appropriate ventilated working areas and equipment to prepare, process and stain frozen or paraffin embedded specimens. The Histology Core contains the following instrumentation: VIP Tissue Processor, BIOCARE NxGen Decloaking Chamber, Rotary Microtome, Staining Center, Leica Cryostat, and Zeiss Axio Microscope/Camera Software.

Metabolic Core: The metabolic core includes: CLAMS units, Minispec LF-50/mq 7.5 NMR (Brucker Optics) analyzer, BioDAQ system (Research Diets), Metabolic Cages (Tecniplast), DSI Telemetry Systems (Data Sciences International), MC4000 blood pressure and heart rate analyzer for mice (Tailcuff method, Hatteras Instruments), Mouse Ox Plus Vital signs monitor (Starr Life Sciences). Laboratory Tests and Instrumentation: The Cobas c311 clinical chemistry analyzer (Roche Diagnostics), a GM7 analyzer (Analox instruments), a Luminex 200 (Luminex Coorporation), 24 and 96-wells Sea Horse analyzers (SeaHorse Biosciences), and an AR-2000 radio-TLC Imaging Scanner (Eckert & Ziegler).

Nuclear Magnetic Resonance (NMR): Instrumentation includes three Bruker nuclear magnetic resonance instruments, two Avance 400 MHz ULTRAShield instruments and one Avance III 700 MHz ULTRAShield instrument. The machines run 24 hours a day, 365 days of the year and are fully equipped to run multi-nuclear 1D and 2D experiments, with both direct and indirect detection for a variety of nuclei.

Proteomics and Mass Spectrometry: The core includes: ThermoQ Exactive with Thermo Easy-nLC 1000 Liquid Chromatograph, Thermo LTQ Orbitrap with Eksigent NanoLC Ultra, Thermo LTQ-ETD with Agilent HP1100, Bruker MALDI-ToF (MicroFlex), Agilent 1100 with UV and fraction collector HPLC, TA Nano Isothermal Titration Calorimeter (ITC).

X-Ray Crystallography Core Facility: The core includes: Minstrel III, RoboIncubators, Leica stereomicroscope, Gryphon Crystallization Robot, **Bruker AXS Smart APEX CCD** ﻿diffraction system, Rigaku MicroMax-007 HFM X-ray generator with a VariMax HR optics and an X-Stream 2000 crystal cryo-freezing system, Mar345dtb image plate detector, and **Proteros Free Mounting System (FMS).**