



The University of Texas  
Health Science Center at Houston

**Research  
Resources**

*Photography: Nash Baker, 2006  
Assassi, 2006  
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**UTHealth**

# RESEARCH RESOURCES

## **Delivering Innovative Solutions for the Future**

The University of Texas Houston Health Science Center (UTHealth) is recognized internationally as one of the world's great research universities. UTHealth connects research, education, patient care and outreach in bold, innovative ways. Basic scientists and clinical researchers from all disciplines work together to deliver innovative solutions that create the best hope for a healthier future. Enclosed you will find a list of resources available to help our scientists and clinicians to pursue their research mission.

**Please contact**  
**SharedResearchResources@uth.tmc.edu**  
**with additional questions.**



# 3D PRINTING CENTER

The UTHealth 3D Printing Center provides 3D printed models of human organs and novel surgical tools, in prototype or final production models. We provide our service with two different state-of-the-art 3D printers with large printer beds. Our multicolor Stratasys J750 resin-based system provides 14- or 28-micron resolution with a wide variety of materials with varying Shore A hardness values and colors. Our other printer, a Fortus 450mc, is a fused deposition of material (FDM) type of machine, that uses small tips to extrude material, with a resolution as good as 127 micron.

## **Services:**

- Large Scale, High-Resolution 3D Printing of both Production Models and Prototypes.
- Prototype and production models
- Novel surgical instruments
- Human organ models based on MRI or CT-SCAN images
- A variety of Shore A (hardness) values
- Large palette of colors
- Fortus 450mc 3D printer
- Stratasys J750 Polyjet 3D printer
- Support Removal

## **Contact for further information:**

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# ATOMIC FORCE MICROSCOPY SERVICES

Atomic Force Microscopy (AFM) is a technique for characterizing surfaces and producing topographic images under physiological-like conditions using noninvasive bio-sensing technology. Scanning can be performed in air or in a liquid environment. A range of samples, from living cells down to single molecules, can be imaged. AFM is also an attractive tool for studying the dynamics of cellular endocytosis of nanovectors and the systemic response to biological processes. Measuring the stiffness of samples (Elastic Modulus) is a common use of AFM. The elastic modulus is a useful indication of cell growth, differentiation, disease, or response to treatment. In addition, non-cellular structures, such as nanoparticles or chemical scaffolds, can also be imaged.

## **Services:**

- AFM imaging combined with bright-field/fluorescence microscopy
- Topographical imaging of samples in air or liquid environments
- Time-lapse experiments that show changes in sample morphology or structure
- Studies of local micromechanical properties of samples (elasticity, stiffness, roughness)
- Data analysis to determine homogeneity of samples, size distribution, position, mapping and 3D imaging
- Post-imaging analysis. Additional measurements can be provided to calculate stress forces, area measurements for regions of interest, estimate roughness or calculating Young's modulus.

## **Contacts for further information:**

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# BIOBANK SERVICES

The Center for Clinical and Translational Sciences (CCTS) Biobank is a repository of human biospecimens and associated data available for collaborative sharing with qualified researchers. The Biobank utilizes a federated model of sharing by which biospecimens and data remain in the custodianship of contributing investigators, the majority of whom conduct research within the Texas Medical Center, prior to the contributor's approval to share with a qualified requesting investigator. The CCTS Biobank facilitates collaborative sharing to expedite research, discovery, and translation to the individual patient by providing a communication link between requesting and contributing investigators; managing requests, contributions, and research investigator agreements; and maintaining Biobank databases for biospecimen and associated data inventory.

## **Types of biospecimens available for request:**

- Plasma
- Serum
- DNA
- Peripheral blood mononuclear cells
- Red blood cells
- Saliva
- Urine

Biospecimens and data currently available are from individuals having the following conditions:

- Cardiovascular diseases
- Cancer
- Diabetes and other autoimmune disorders
- Other various disease types

For more information about the CCTS Biobank, including how to submit a request for or contribute biospecimens and/or data, please visit the Biobank website at: <https://www.uth.edu/biobank/index.htm>

## **Contact for further information:**

[UTHealth CCTS Biobank@uth.tmc.edu](mailto:UTHealth_CCTS_Biobank@uth.tmc.edu)

# BIOINFORMATICS AND HIGH PERFORMANCE COMPUTING

The UTHealth Bioinformatics and High Performance Computing Service Center specializes in the analysis and interpretation of data generated from biomedical experiments. We are experienced in the analysis of microarray and next generation sequencing (RNA-Seq, ChIP-Seq, variant detection) data. Service is also available for custom software and algorithm development. Finally, we assist in the preparation of manuscripts and grants. The service center is managed collaboratively by the University of Texas Health Science center at Houston (UTHSC) and the MD Anderson Cancer Center (MDACC) and receives support from the Center for Clinical and Translational Sciences.

## Services:

### SHORT-TERM PROJECTS

- Gene Annotation
- Microarray Analysis
- Metabonomics Analysis
- Proteomics Analysis
- Genotyping Analysis
- Next-Gen Sequencing Analysis
- High Performance Computing
- Custom Data Analysis
- Consultations and Grant Writing
- Collaborative Grant Writing Assistance
- Initial Consultation

### LONG TERM PROJECTS

- Complex or Long-Term Projects
- Metabonomics

## Contact for further information:

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# BIOMEDICAL INFORMATICS GROUP

## UT-BIG (Bioinformatics IT Group)

A diverse group of Informaticians and IT professionals with backgrounds in Computer Science, Applied Mathematics, Project Management, Library Sciences, Biology. We collect, interpret, and manage data for the support of clinical and translational research. As co-investigators we develop new methods for reusing data for research.

## Services offered:

**Study Feasibility and Cohort identification:** We can query the CDW to confirm the number of patients that meet criteria for your study. This information can then be used to show feasibility when selecting sample sizes.

**Grant Application:** Provide budget estimates for technical support. Supply application security configurations for IRB approval.

**Regulatory Compliance:** We comply with HIPAA and work closely with the UTHealth Committee for the Protection of Human Subjects, IT Security, and University Privacy Office. Our team members can provide solutions for appropriately protecting your systems and their data content.

**Custom Solutions:** BIGTxt is a text messaging system with two way communication for behavior modification efforts, promoting health education, and sustaining subject participation in studies.

**RedCap:** a web-based data repository which provides for capturing subject information and associated study data. Features include, randomization, multi-site support, mobile data collection and is HIPAA compliant.

**Custom Applications:** If you can dream it, we can build it.

<https://sbmi.uth.edu/uth-big/>

## Contact for further information:

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# CANCER GENOMICS CORE

The The UTHealth Cancer Genomics Core (CGC) aims to provide next-generation sequencing (NGS) and advanced bioinformatics services to the cancer investigators in UTHealth, Texas Medical Center, and other Texas regions. CGC has four units: Sample Management Unit, NGS Sequencing Unit, Bioinformatics Unit and Training/Outreach Unit.

## Services/Equipment Available:

NGS service:

- Free consultation on study design and sample submission
- DNA/RNA preparation, library preparation and NGS
- Sequencing services including WES, WGS, RNA-Seq, scRNA-Seq, small RNA-Seq, ChIP-Seq, WGBS/Methyl-Seq, Targeted gene sequencing

Bioinformatics services:

- NGS data analysis (WGS, WES, microRNA, lncRNA, ChIP-Seq, methylation and single cell RNA-Seq data)
- Array data analysis such as GWAS analysis and CNV analysis
- Advanced bioinformatics services including gene set enrichment analysis (Gene Ontology, pathways, etc.), network analysis, disease association analysis, functional genomics analysis (eQTL, ENCODE, tissue-specificity, etc.), results interpretation, machine learning and applications, databases, pharmacogenetics and pharmacogenomics data analysis, imaging data analysis

NGS related equipment:

- Illumina NextSeq 550
- 10X Genomics Chromium™ Single Cell Controller
- Bio-Rad Droplet Digital PCR (QX200 ddPCR SYS)
- TapeStation 4200
- Cavaris E220 Focused-ultrasonicator system
- QuBit DNA/RNA/Protein quantitation system

Other services:

- Grant proposal development
- NGS training in bioinformatics

## Contact for further information:

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# CARDIAC CATHETERIZATION SERVICES

The UTHealth Cardiac Catheterization Lab provides a GE Medical Systems Advantx LCN+ Biplane with Advantage workstation. This imaging system is angiographic and radiographic biplane positioner for use with the x-ray system Advantx. It consists of the angiographic biplane positioner, vascular table and x-ray system. The system is used for diagnostic angiographic fluoroscopy and radiography. In addition, with the system, 3-D models can be created from images acquired during a digital subtraction angiography study of the frontal plane. GE's Advantage workstation then reconstructs and displays the image data, and users can manipulate the 3-D images using a variety of software tools..

Current and potential uses of the cath lab include:

1. Percutaneous intervention such as device deployment, vascular intervention and site-specific drug delivery using real-time fluoroscopic guidance.
2. Identification and characterization of vascular anatomy using contrast enhanced angiography
3. Precise percutaneous biopsy using biplane fluoroscopic guidance.
4. Orthopedic and spinal research and intervention
5. Multimodal fusion imaging for anatomical localization
6. Training for interventional cardiologists and radiologists
7. Phantom development for fluoroscopic and CT imaging applications

In addition, the UT cath lab is in close proximity to MD Anderson imaging facilities including MRI, PET CT and CT which are available for use in conjunction with the cath lab. Expertise is available to those within UTHealth and the Texas Medical Center who have a need for this technology for large animal, pre-clinical studies. The catheterization Lab is located on the ground floor of the MD Anderson 3SCRB (CABI) building at the South Campus.

## Services - Equipment Available for Reservation:

- Advantx LCN+ Biplane – biplane angiographic fluoroscopy and radiography system capable of 3-D image reconstruction and image intensifier distortion correction
- GE Advantage Workstation – for reconstruction and manipulation of image data

## Contact for further information:

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# CELLULAR THERAPY SERVICES

The Cellular Therapy Core (CTC) enables the translation, scale-up, and validation of promising new therapeutic technologies developed by scientists and/or physicians at a preclinical level, into clinical-grade processes that can be used to manufacture cell-based and/or tissue engineered and/or combination products for clinical applications. It consists of **The Judith R. Hoffberger Cellular Therapeutics Laboratory**, located on the 6th floor of the Medical School Building, and **The Evelyn H. Griffin Stem Cell Therapeutics Research Laboratory**, located on the 6th floor of the Behavioral and Biomedical Sciences Building, two state-of-the-art CLIA- and FDA-registered facilities designed and engineered to comply with current Good Manufacturing Practice (cGMP) and Good Tissue Practice (cGTP) of the FDA.

Both facilities successfully passed FDA inspection with all conditions found to be in compliance with federal regulations, and are accredited by the College of American Pathologists (CAP) and the Foundation for Accreditation of Cellular Therapy (FACT) for cellular therapy product processing with more than minimal manipulation, two of only four laboratories in Texas with such accreditation and the first in the nation to be accredited under the new Common Standards for Cellular Therapy.

The CTC's mission is to provide innovative clinical-grade cell-based and/or tissue engineered and/or combination products and advanced therapies with quality suitable for intended use in humans; it currently supports multiple clinical trials funded by NIH, DOD, CPRIT, disease-focused nonprofit organizations and industry. The CTC provides services to in-house investigators, as well as external organizations.

We can provide expertise in:

- Regulatory issues and process development
- Development and/or translation, optimization, scale-up and validation of manufacturing processes
- Development and writing of cGMP-compliant documents, such as Standard Operating Procedures (SOPs), Production Batch Records, Validation Plans, etc.
- Development and validation of protocol-specific quality control (QC) assays
- Support of IND applications (Pharmaceutical Quality/CMC section)
- FDA-compliant manufacturing of clinical-grade cell-based and/or tissue engineered and/or combination products
- Pre-clinical Flow-cytometry services
- FDA-compliant Quality Control Testing

**Please contact us to discuss your specific needs.**

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# CENTER FOR ADVANCED MICROSCOPY NIKON CENTER OF EXCELLENCE

The Center for Advanced Microscopy and Nikon Center of Excellence at UTHealth provides state-of-the-art imaging capabilities, assistance and training to those within UTHealth and the Texas Medical Center whose research can benefit from cutting edge light microscopy. The Center's expert staff stand ready to provide access and training in a wide range of imaging systems for the purpose of molecular, cellular, tissue, and whole animal imaging.

## **Services - Equipment Available for Reservation:**

- **Nikon n-STORM Microscope** for Super-resolution Stochastic Optical Reconstruction Microscopy (STORM) with Total Internal Reflection Fluorescence (TIRF) capabilities combined with a A1Rsi confocal laser microscope system with spectral and resonant scanner confocal system.
- **Nikon n-SIM Microscope** for Structured Illumination super-resolution Microscopy (SIM) with live-cell 2D, 3D and TIRF-SIM capabilities.
- **Nikon A1 Confocal Laser Microscope + PicoQuant** pulsed laser imaging system for performing Fluorescence Lifetime Imaging (FLIM).
- **Nikon A1R Confocal Laser Microscope** with enhanced detectors to give brighter signals, enhanced signal-to-noise ratio, and less phototoxicity combined with spectral and resonant detectors.
- **Nikon Ti-E Widefield Microscope** for imaging small molecules (e.g. calcium, nitric oxide, pH) in live cells.
- **Lambert LIFA Fluorescence Lifetime Imaging Microscope** for frequency domain measurement of fluorescence lifetime with high accuracy, stability and acquisition/processing speed.
- **IVIS Lumina XR** live whole animal imager for longitudinal fluorescence, bioluminescence, and X-ray in vivo and ex vivo studies.
- **Image Analysis and Data Processing Computers** with NIS-Elements AR, LI-FLIM, Living Image, MetaMorph, SlideBook, SoftMaxPro, AutoQuant.

## **Contacts for further information:**

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# CENTER FOR LABORATORY ANIMAL MEDICINE & CARE (CLAMC)

The Center for Laboratory Animal Medicine and Care (CLAMC) is responsible for the health and well-being of laboratory animals used for the institution's biomedical research programs. CLAMC has been awarded full accreditation by AAALAC-International.

## **Available services:**

- Animal ordering from approved and nontraditional vendors (all animal orders are required to be placed by CLAMC)
- Access to animal colony information and current billing data via the iCARE software from any UT computer, any mobile device, or by using VPN.
- Husbandry and veterinary care for all large and small animal species and aquatic species
- CLAMC veterinarians and staff onsite seven days a week
- Consultation with veterinary faculty on protocol writing, animal model development, and procedures/techniques
- Veterinary technical support for all large animal perioperative care
- Well-equipped large animal operating rooms with multi-parameter patient monitors, circulating water heating pads, Bair® Hugger heated air pads, heated surgical tables, gas anesthetic machines, and mechanical ventilators
- Digital radiography for rats and large animals (Note: For mice, contact the Center for Advanced Microscopy.)
- Sterilization services including steam autoclave and ethylene oxide gas sterilization
- Annual evaluation of isoflurane vaporizers in labs can be performed by veterinary technicians
- Rodent surgery and procedure rooms are available in each facility. Mobile and tabletop isoflurane anesthetic machines are available for an hourly rental fee.
- Classroom and hands-on training on the care and use of laboratory animals (required for faculty, staff, trainees and collaborators working under approved UTHealth animal protocols)
- In house diagnostic laboratory services include CBC, Chemistry and Electrolyte panels, blood gas, urine, and fecal analysis. Additional tests, such as bacterial culture and sensitivity, and Transnetyx genotyping services can be arranged by CLAMC.

## **Contacts for further information:**

[acare@uth.tmc.edu](mailto:acare@uth.tmc.edu)

CLAMC Main business office number and for veterinary assistance: 713.500.7728

CLAMC Diagnostic laboratory services: 713.500.7735 or 7739

CLAMC Surgery technicians: 713.500.7737 or 7738

# CLINICAL & TRANSLATIONAL PROTEOMICS SERVICES

The Clinical and Translational Proteomics Service Center provides proteomics and mass spectrometry supports to the researchers at UT Health Science Center at Houston and the greater research community of the Texas Medical Center. The basic services include protein identification, protein quantification and characterization of post-translational modifications (PTMs) in a broad range of research specimens, from purified protein samples to complex mixtures such as cell and tissue extracts, as well as biofluids. We also provide advanced supports through funded collaborative efforts, such as biomarker discovery and verification, functional proteomics for drug study, development of quantitative proteomics assays for large cohort analysis and metaproteomics for human gut microbiome profiling. The service center contains the cutting edge instrumentation and trained personnel to provide an integrated proteomics analysis, including sample preparation (if needed), mass spectrometric analysis and bioinformatics data processing to support basic, translational and clinical research.

## **Services:**

- Protein identification from 1D gel bands, 2-D spots and other matrices.
- Characterization of immunoprecipitated or affinity-purified proteins and protein complexes.
- Global protein profiling for peptide/protein identification in a complex sample.
- Enrichment and characterization of post-translationally modified proteins and peptides.
- Accurate molecular weight determination, peptide QC.
- Quantitative analysis of protein abundance and PTM status (Label free, iTRAQ, TMT, SILAC etc).
- Targeted proteomics assays for selected peptide/protein quantification.
- Biopharmaceutical protein QA/QC, mapping, stability, impurity, protein or peptide with drug or dye conjugate.
- Preclinical assay and clinical assay development for tissue or bodily fluid detection.
- Characterization of PTMs with complex structures, such as glycosylation and SUMO.
- Metaproteomics profiling of microbiomes.
- Biomarker development with large cohorts of clinical specimens.

## **Contacts for further information:**

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# CLINICAL RESEARCH UNIT

Dedicated Clinical Research Units (CRUs) for conduct of clinical studies

The mission of the CCTS CRUs is to facilitate clinical research by providing investigators with specialized facilities, personnel, and advice. Investigators from CCTS institutions (UTHSC-H, M. D. Anderson Cancer Center, and Memorial Hermann Hospital System) can use any of the CCTS CRUs, depending on the location of their patients and the availability of services at the three CRUs. For assistance designing and implementing clinical studies at the UTHSC-H CRU at Memorial Hermann—Texas Medical Center.

The UTHSC-H CRU at Memorial Hermann—Texas Medical Center offers UT researchers an optimal on-campus resource and expanded capabilities for conducting clinical investigations, while serving as an environment for training health professionals in clinical research. The CRU, located on the 3rd floor of the Robertson Pavilion in Memorial Hermann Hospital, is devoted entirely to the implementation and conduction of clinical research.

The CRU team is comprised of 7 clinical research nurses with a variety of clinical backgrounds, 3 experienced study coordinators, 2 lab specialists and 3 administrative members. All of our staff members, most of whom are cross-trained with coordinating and lab experience, work closely together to offer expertise and deliver the best clinical research support to the UT and Memorial Hermann research community.

## **The CRU provides access to specialty core services, such as:**

- 6 outpatient and 4 inpatient rooms;
- Scheduling diagnostic tests and procedures
- Consulting support in early stages of protocol development
- In-patient and out-patient clinic space
- Nursing and/or coordinator services
- Regulatory monitoring
- Lab services including cell reconstitution and Nitrogen storage

## **Contacts for further information:**

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# DNA SEQUENCING AND GENOTYPING CORE LABORATORY

The Genetic Core Laboratory provides consultative expertise, mentoring, and technical support for human genetics studies and access to DNA banking and genetic technologies, including DNA sequencing and microsatellite or SNP genotyping techniques. The DNA Sequencing and Genotyping Core Laboratory Program is composed of following major components:

- Consultative and mentor-based support services that provide individual investigators with guidance in the design, application, and interpretation of their genetic studies
- Sanger DNA sequencing and microsatellite and SNP genotyping services that generate preliminary data supporting translational genetic research studies.
- Infrastructure for banking DNA and other samples from patient populations and laboratory management system for sample tracking.
- ABI3730xl Genetic Analyzer – for Sanger DNA sequencing or microsatellite or SNP genotyping assays.

## **Contacts for further information:**

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DONGCHUAN GUO, PhD, Co-Director

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# ELECTRON CRYO-MICROSCOPY CORE FACILITY

The mission of Electron Cryo-Microscopy (CryoEM) Core Facility at UTHealth is to provide researchers access to the state-of-the-art cryo-EM resources and expertise. Over the past decade electron cryomicroscopy (cryo-EM) has emerged as the most applied technique capable of determining structures of a wide variety of challenging biological structures ranging from individual molecules and their assemblies to subcellular organelles. To date, cryo-EM is a proven alternative to X-ray crystallography for 3-D structural analysis at atomic resolution. These remarkable advances open a new door in structural biology attracting a steadily growing community of researchers around the world motivated by the prospect of using cryo-EM to tackle high-resolution structures of molecular targets that are associated with human diseases but have not been amenable to the traditionally employed X-ray crystallography and NMR spectroscopy. UTHealth has created the Cryo-EM Core Facility to meet needs of researchers in the Texas Medical Center at Houston and nationwide who do not have adequate access to the latest cryo-EM instrumentation and expertise.

## **Instrumentation and Services:**

- Our CryoEM Core Facility houses a Titan Krios G3 (Thermo Fisher Scientific Inc.) equipped with a post-GIF BioQuantum with K2 Summit direct detector; FEI Volta Phase Plate; FEL Ceta CMOS camera, and 12-position cryo-sample autoloader, a Polara F30 (300 keV) equipped with a K2 Summit Direct Electron Detection Camera (Thermo Fisher Scientific Inc.) and the ancillary equipment required to prepare optimal cryospecimen.
- The CryoEM Facility is able to provide high-resolution imaging for single particle analysis and for electron cryo-tomography (cryo-ET). We can assist with optimal specimen preparation.

## **Contact for further information:**

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# FLOW CYTOMETRY SERVICES

The Flow Cytometry Service Center is located on the sixth floor of the Fayed S. Sarofim Research Building and maintains four instruments, a BD FACSAria II SORP cell sorter (6 laser system), a BD FACS Calibur (2 laser/4 color system), a Coulter FC500 (2 laser/ 5 color system) and a Luminex LX200 multiplex instrument. There are additional workstations available for post-acquisition data analysis.

These specialized instruments allow researchers to evaluate a large number of samples at the cellular level in a short time frame. The Core offers FACS acquisition and analysis, cell sorting, and consultation for experimental design, interpretation and troubleshooting.

The Flow Cytometry Service Unit is committed to the continuing development of biological research and provides training, instrumentation, technical expertise, data analysis and interpretation for many IBC approved studies.

## **Services provided:**

- Assisted and Unassisted data acquisition
- Assisted and Unassisted cell sorting
- Sorting for Single cell deposition (ex. 96 well plate)
- Post-acquisition data analysis (FlowJo, Diva, Kaluza)
- Experimental design assistance including panel design, controls, etc.
- Troubleshooting
- Training to become an unassisted users

All investigators are encouraged to meet with core staff to discuss the experiment prior to scheduling to discuss panel design, appropriate controls, technical limitations, etc.

The FCSC offers training for both new and experienced investigators. Depending on the level of prior knowledge and the intended frequency of use of the equipment, the training plan is tailored to the specifically to the individual's needs.

## **Contact for further information:**

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# HISTOLOGY LABORATORY SERVICES

Our fully functional histology laboratory is equipped with state-of-the-art equipment to perform all aspects of histology processing, sectioning, and staining. Our laboratory is CLIA/CAP certified, staffed by experienced and professional histologists and histotechnologists, and provides high quality services for UT researchers. We will consider providing services outside of UT in the future.

## **Histology Services: Available for human and animal tissues:**

- Cutting and staining sections from frozen tissues (frozen sections).
- Processing and paraffin-embedding of cells (cell lines) and tissues.
- Cutting and hematoxylin-eosin (H&E) staining of sections from formalin-fixed and paraffin-embedded cells and tissues.
- Special stains: Please see list of currently available tests; we can evaluate and perform special stains that are not on the list upon request.
- Immunohistochemical stains: we are equipped with hundreds of antibodies for diagnosis as well as biomarkers for therapeutic and prognostic evaluation
- Immunofluorescence: please see list of currently available tests.
- In situ hybridization: for lymphoma workup and evaluation for different virus infection.

## **Pathology Services:**

We are available for consultations and collaborations:

- We provide consultation services by our experienced pathologists with subspecialized training
- We can recommend the most appropriate reagents to purchase and tests to utilize.

## **Contact for further information:**

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# HUMAN GENETICS LABORATORY

The UTHealth Human Genetics Center Laboratory features platforms spanning low to high throughput capacities that can be tailored to meet your study's individual goals. We have extensive knowledge and experience with genotyping and methylation assays and utilize a suite of liquid handling robotic systems with a fully integrated laboratory information management system (LIMS) for sample tracking. In addition to typical core services, we also provide post laboratory quality control and quality assurance analyses. Our automated workflow and turnkey deliverables enable us to generate high-quality, low-cost data with rapid turnaround times.

## Genotyping

- Whole Genome and Consortium Arrays
  - Illumina Infinium
- Custom Low to Mid-Plex Genotyping
  - TaqMan Allele Discrimination
  - Agena Bioscience MassARRAY and MassCLEAVE
  - Quantitative real time PCR

## Methylation

- Illumina Infinium MethylationEPIC Arrays
- Custom Agena Bioscience EpiTYPER Methylation Arrays

## Sequencing

- Targeted Next-Generation Sequencing

## Sample Collection and Processing

- Collection and storage for a wide variety of sample types
- DNA extraction
- RNA extraction
- Globin depletion

## Equipment Usage

- Illumina iScan

## Contact for further information:

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ALANNA MORRISON, Ph.D., Director and Professor – Human Genetics Center

MEGAN L. GROVE, MS, Associate Director – Human Genetics Center Laboratory

# HUMAN HEALTH RESEARCH PROTECTION PROGRAM

The goal of the UTHealth human research protection program (HRPP) is to protect rights and wellbeing of human subjects and promote ethical human subjects research. The UTHealth HRPP includes several components including the Committee for Protection of Human Subjects and the Clinical Trials Resource Center (CTRC).

The mission of the CTRC is to provide resources, expertise, and best practices for investigators and research staff to facilitate efficient, compliant and ethical clinical trial conduct and management.

## **The services provided by the CTRC include:**

- Clinical Trials Registration
- IND and IDE applications
- DSMB Coordination
- Clinical Research Education for study personnel
- Preparation for FDA Inspection

## **Contact for further information:**

[clinicaltrials@uth.tmc.edu](mailto:clinicaltrials@uth.tmc.edu)

## **Committee for the Protection of Human Subjects**

The UTHealth Institutional Review Board is called the Committee for the Protection of Human Subjects (CPHS). The UTHealth CPHS has four IRB review panels that meet on the first to fourth Friday of each month.

## **Contact for further information:**

[cphs@uth.tmc.edu](mailto:cphs@uth.tmc.edu)

# iLAB SOLUTIONS

Many of our shared resources use iLab Solutions as a service request management platform. This system is integrated with both our financial and identity systems at UTHealth. Therefore, you can log in using your UTHealth credentials and it will automatically pull up funding sources linked to your name. In addition, it allows you to easily access shared resources at our sister institutions.

To access the portal please go to: <https://uthealth.corefacilities.org>

## **Contacts for further information:**

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# MAGNETIC RESONANCE IMAGING

The MRI Center provides state-of-the-art magnetic resonance imaging both in humans and animals. In addition to routine high resolution imaging, the center can perform advanced imaging studies such as diffusion tensor imaging, functional MRI, magnetic resonance spectroscopy imaging. The center personnel can assist the investigator with the MRI protocol that is tailored to the individual needs. In addition, the center also can perform quantitative image analysis. The center provides services to investigators from UTHealth, TMC, Rice University, and University of Houston. The Center for Advanced Microscopy provides state-of-the-art imaging capabilities as well as expertise to those within UTHealth and the Texas Medical Center who have a need for cutting-edge imaging technology. The instruments housed in the Center, as well as the expert individuals who stand ready to provide training, are available to provide access to vital imaging systems for the purpose of molecular, cellular, tissue and whole animal imaging. It is essential to schedule the scans in advance. Walk-ins will not be accommodated. The investigators should have IRB approval for human studies and AWC approval for animal studies. The center personnel can help investigators with the IRB or AWC protocols.

## **Equipment:**

Human and large animals (including nonhuman primates) studies:

- 3T Philips Ingenia scanner
- Multiple RF coils
- SenasVue for fMRI
- Mock scanner for training subjects

Small animal studies:

- 7T Bruker 30 cm horizontal bore scanner
- Multiple RF coils

## **Contacts for further information:**

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# PRE-CLINICAL COMPUTED TOMOGRAPHY

The eXplore Locus Ultra Pre-Clinical cone-beam CT (GE Healthcare, London, ON) is a unique scanner, one of only a few built, that is a hybrid between clinical and micro-CT systems. A 25 cm bore and 14 cm diameter field of view (10 cm Z-coverage), coupled with relatively high resolution (154 micrometer isotropic voxel size) makes the Ultra an ideal system for the imaging of animals from the size of rats to rabbits and other similar sized animals or specimens. X-rays are produced by a variable voltage X-ray source tube capable of energies from 70 to 140 kVp, filtered by 3.5 mm Al and 0.5 mm Cu. The source tube and charge-coupled flat-panel detector rotate on a gantry with rotation speeds as high as 1 sec, permitting scan times nearly as short as clinical systems.

This imaging modality can facilitate studies among multiple disciplines: orthopedics, pulmonary, cardiovascular, gastrointestinal, genitourinary, oncology, and others.

## **Services - Equipment Available for Reservation:**

- eXplore Locus Ultra Pre-Clinical cone-beam CT (GE Healthcare, London, ON)

## **Contact for further information:**

DELIA DANILA, PhD, Assistant Professor and Core Facility Director  
[Delia.Danila@uth.tmc.edu](mailto:Delia.Danila@uth.tmc.edu)

# SAFETY, HEALTH, ENVIRONMENT & RISK MANAGEMENT (SHERM)

Safety, Health, Environment & Risk Management's mission is to work in conjunction with the UTHealth community to ensure that education, research, and health care service activities take place in conditions that are optimally safe and healthy for all students, faculty, staff, visitors, surrounding community and the general public.

## **Services:**

- SHERM provides a variety of safety services to ensure that all students, faculty, and staff go home as safe and as healthy as they arrived. SHERM ensures that any research protocols submitted to the radiation safety, chemical safety, or biological safety committees are streamlined as best as possible for review and approval by these faculty-lead committees. SHERM is a service-oriented unit and readily assists faculty in the preparation of protocols that further the teaching, research, and service missions of the university.
- SHERM provides a variety of services including dosimetry, safety compliance training, hazardous waste collection, IRB and CLAMC protocol review facilitation, assistance with shipping of potentially hazardous substances.
- SHERM has industrial hygiene monitoring equipment available for researcher to use. This portable monitoring equipment can measure noise, vibration, chemical exposures, aerosol particulates, radiation, etc. Equipment is available per request.
- They maintain two shared irradiator sources for research use providing 1.61 Gy/min and 1.14 Gy/min respectively.
- Additionally they oversee the Occupational Health Clinical services which includes new employee screening, management of employee injuries and exposures, monitoring of community based disease and specialized testing in high risk research areas.

## **Contact for further information:**

EHS Main Office: 713.500.8100

EHS Hotline: 713.500.5832

For Emergencies always dial 911

# SMALL ANIMAL CARDIOVASCULAR PHENOTYPING CENTER

The Small Animal Cardiovascular Phenotyping Center at McGovern Medical School provides access to state of the art equipment and expertise for mouse and zebrafish cardiovascular physiology.

- State-of-the-art Vevo 3100 echocardiography platform with 3D/4D mode capability and multiple software modules including VevoVasc Ultra, VevoStrain Analysis, and LV Trace.
- Doppler system for high-velocity vascular flow measurements
- Coda tail-cuff volume blood pressure recorder
- ADInstruments PowerLab high-fidelity pressure recorder for use with Millar catheters
- Leica A60 S Stereo Microscope with image capture

**Contact for further information:**

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# SPONSORED PROJECTS ADMINISTRATION (SPA)

SPA supports UTHealth faculty, staff and students in the acquisition and administration of programs funded from sources outside of the University. SPA is the central point of coordination for sponsored projects, and is UTHealth's authorized representative for grants, contracts, and agreements from government agencies, private industry, and non-profit foundations.

SPA's mission is to offer broad expertise, guidance, and assistance to faculty and students who are actively applying for funding from various sources. We work directly with each department to ensure accuracy and completeness of grant proposals/applications and contracts.

Sponsored Projects Administration (SPA) is located on the tenth floor of the University Center Tower.

## **SPA's oversight includes:**

- Grant proposal submissions and award management (administrative and financial)
- Federal and Non-Federal contracts and Subcontracts
- Clinical Trial Agreements
- Confidentiality Agreements
- Sponsored and Collaborative Research Agreements
- Material Transfer Agreements
- Data Use Agreements
- Salary Reimbursement Agreements
- Financial Reporting to Sponsors
- Time and Effort Certification

## **SPA contact information:**

[preaward@uth.tmc.edu](mailto:preaward@uth.tmc.edu)

713.500.3999

<https://www.uth.edu/sponsored-projects-administration/index.htm>

# TEXAS ADVANCED COMPUTING CENTER

The Texas Advanced Computing Center at The University of Texas at Austin (TACC) designs and operates some of the world's most powerful computing resources. The center's mission is to enable discoveries that advance science and society through the application of advanced computing technologies. TACC offers a comprehensive ecosystem of leading-edge resources in high performance computing (HPC), visualization, data analysis, storage, archive, cloud, data-driven computing, connectivity, tools, APIs, algorithms, consulting, and software. In addition, TACC's skilled experts work with thousands of researchers on more than 3,000 projects each year.

## How can TACC help?

- Provide high performance computational tools to tackle modern biological research questions
- Consult with you to optimize your software code, pipelines, or workflows and accelerate the pace of discovery
- Administer local support and classroom or web-based training opportunities in areas of scientific computing
- Offer a variety of other resources including big data storage, fast networks, specialized hardware, cloud services, web portals, graphic interfaces, and more

Website: [www.tacc.utexas.edu](http://www.tacc.utexas.edu)

## Contact for further information:

WILLIAM ALLEN, PhD  
Life Sciences Computing  
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# THERAPEUTIC ANTIBODY CORE

The successful clinical use of monoclonal antibodies is one of the most significant advances in cancer treatment today. Antibody-based therapies provide desirable attractive specificity, multiple mechanisms of action, and desirable safety profiles. Humanization, optimization for drug-like properties, and cloning antibody genes for expression in large quantities are labor-intensive processes requiring specialized equipment and expertise that challenge the translation of basic research to the discovery of drug candidates.

The CPRIT (Cancer Prevention Research Institute of Texas) Therapeutic Monoclonal Antibody Lead Optimization and Development Core Facility, which uses the abbreviated title the Therapeutic Antibody Core, aims to provide state-wide support and service to advance lead antibodies from academic laboratories to the stage of preclinical development. Core service is divided into four modules and performed by a team with diverse and complementary knowledge and expertise.

## The four modules are:

- **Lead Identification:** Hybridomas, Phage library panning, Single B-cell cloning
- **Lead optimization:** Antibody gene cloning, Humanization, Affinity
- **Lead construction:** Antibody drug conjugation (ADC), Bi-specific antibody constructs, IgG isotypes and Fc engineering
- **Antibody production:** Hybridoma cell lines, HEK293 transient, CHO stable cell lines

Individual monoclonal antibody services are also available.

## Contacts for further information:

<https://www.txtac.net>

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NINGYAN ZHANG, PhD, Co-Director

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# TRANSGENIC AND STEM CELL SERVICES

The Transgenic and Stem Cells Service Center was established in 1998 and since that time, it has generated over 750 new transgenic, knock-out and knock-in mouse animal models for investigators from UTHealth, as well as for scientists from numerous other academic institutions. The stem cell lines that have been derived in the laboratory are highly effective for the generation of knock-out / knock-in mice and for cell differentiation studies. These cell lines are routinely used in the Core Facility and are also commercially distributed. In addition to the production, cryopreservation and re-derivation of genetically-engineered mice and rats, the services of the facility also include gene targeting, using ES cells or CRISPR/Cas9, derivation of cell lines and intellectual/technical support in different aspects of microsurgery, cell culture and stem cells research.

## Services:

- Microinjection of DNA, BAC or YAC clones for the production of transgenic mice
- Microinjection of ES cells for the production of knock-out and knock-in mice
- Microinjection of DNA for the production of transgenic rats
- Cryopreservation of fertilized mouse and rat eggs and sperm
- Re-derivation of mice and rats from fertilized eggs
- Availability of pathogen-free animal models from high level barrier facility
- Gene targeting, using ES cells or CRISPR/Cas9, selection. Expansion, cryopreservation of mouse ES cells
- Derivation of novel mouse ES cells and other cell lines
- Availability of germline competent mouse ES cell lines (129/SvImJ, C57BL/6 and BALB/c) and antibiotic -resistant mouse fibroblast feeder layer cells

## Contacts for further information:

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